

# Annual Report **2017**



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## Board Profile Index

Adams 10	Danvers 31	Hull 52	Montague 73	Shrewsbury 94
Amesbury 11	Dedham 32	Lawrence 53	Natick 74	Somerville 95
Andover 12	Dukes County 33	Leominster 54	Needham 75	Southbridge 96
Arlington 13	Easthampton 34	Lexington 55	New Bedford 76	Springfield 97
Attleboro 14	Essex Regional 35	Lowell 56	Newburyport 77	State 98
Barnstable County 15	Everett 36	Lynn 57	Newton 78	Stoneham 99
Belmont 16	Fairhaven 37	Malden 58	Norfolk County 79	Swampscott 100
Berkshire County 17	Fall River 38	Marblehead 59	North Adams 80	Taunton 101
Beverly 18	Falmouth 39	Marlborough 60	North Attleboro 81	Wakefield 102
Blue Hills Regional 19	Fitchburg 40	MHFA 61	Northampton 82	Waltham 103
Boston (City) 20	Framingham 41	Massport 62	Northbridge 83	Watertown 104
Boston Teachers 21	Franklin Regional 42	MTRS (State Teachers) 63	Norwood 84	Webster 105
Braintree 22	Gardner 43	MWRA 64	Peabody 85	Wellesley 106
Bristol County 23	Gloucester 44	Maynard 65	Pittsfield 86	West Springfield 107
Brockton 24	Greater Lawrence 45	Medford 66	Plymouth 87	Westfield 108
Brookline 25	Greenfield 46	Melrose 67	Plymouth County 88	Weymouth 109
Cambridge 26	Hampden County 47	Methuen 68	Quincy 89	Winchester 110
Chelsea 27	Hampshire County 48	Middlesex County 69	Reading 90	Winthrop 111
Chicopee 28	Haverhill 49	Milford 70	Revere 91	Woburn 112
Clinton 29	Hingham 50	Milton 71	Salem 92	Worcester 113
Concord 30	Holyoke 51	Minuteman Regional 72	Saugus 93	Worcester Regional 114
				PRIM 115

## Chairman



**Philip Y. Brown, Esq.**

## Vice Chairman



**The Honorable Suzanne M. Bump**  
Auditor of the Commonwealth

# Commission Members **2017**



**Kathleen M. Fallon**

Practice Area Director,  
Public Consulting Group



**Kate Fitzpatrick**

Town Manager, Town of Needham



**James M. Machado**

Sergeant, Fall River Police Department



**Robert B. McCarthy**

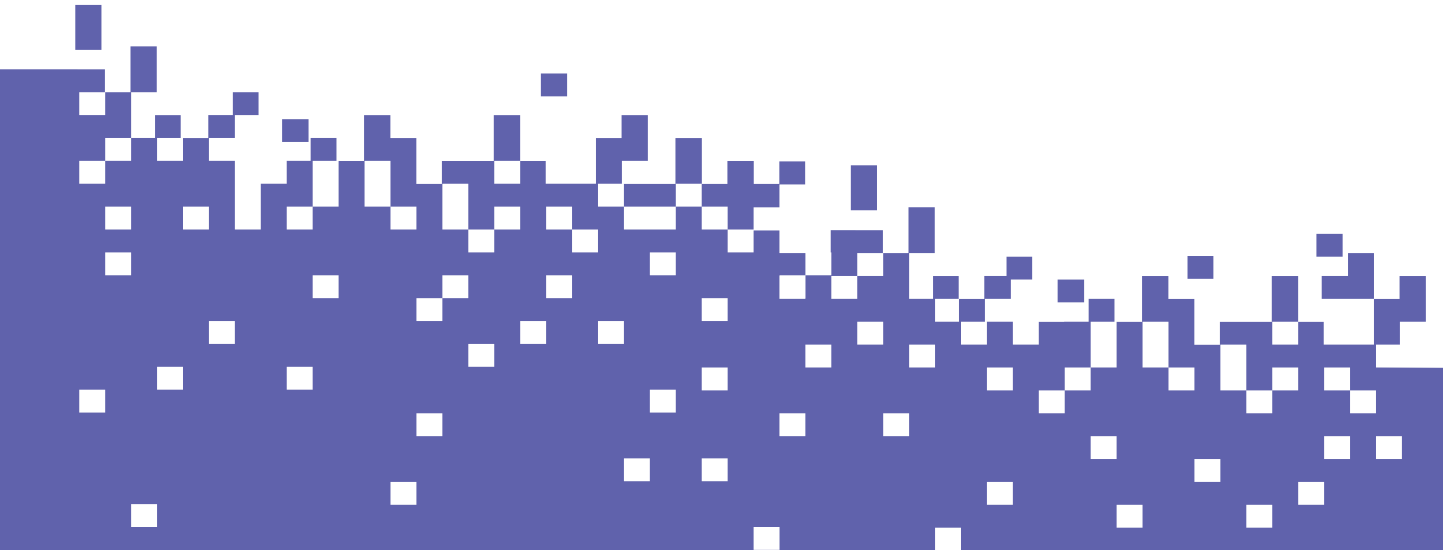
President Emeritus of the Professional Fire Fighters of  
Massachusetts



**Jennifer F. Sullivan**

Assistant Secretary for Capital Finance,  
Administration & Finance

# Mission Statement: **PERAC**



The Public Employee Retirement Administration Commission (PERAC) was created for and is dedicated to the oversight, guidance, monitoring, and regulation of the Massachusetts Public Pension Systems. The professional, prudent, and efficient administration of these systems is the public trust of PERAC and each of the 104 public pension systems for the mutual benefit of the public employees, public employers, and citizens of Massachusetts. The stewardship of the Trust Funds for the sole purpose of providing the benefits guaranteed to the public employees qualifying under the plans is the fulfillment of the obligation of the people of the Commonwealth to those who have dedicated their professional careers to the service of the people of the Commonwealth.



# Letter from **Chairman Philip Y. Brown**



## **The Public Employee Retirement Administration Commission is pleased to release this 2017 Annual Report reviewing the status of the Massachusetts' public pension plans.**

The investment performance of the systems detailed in this Report generally tracked that of pension plans throughout the nation. Although in 2017 Massachusetts' returns ranged from 13.49% to 21.42%, most systems achieved returns between 17% and 19%. Most importantly, long-range performance for all systems exceeded 7.50% and, for 45 systems, equaled or exceeded 9.00%. We are also pleased to note that no system is deemed to be "underperforming" as that term is defined in Chapter 32.

This record is a testament to the dedication and wisdom exhibited by retirement board members over a long period of investing assets. For many, that record has been achieved by taking advantage of the PRIT Fund, while others have charted their own course. In general, the results have been excellent and have laid the ground work for reaching the funding goals we all wish to achieve.

Investment return assumptions used in connection with actuarial valuations of a retirement system's funding status impact the level of unfunded liability that must be amortized. As a result,

the appropriation mandated pursuant to the funding schedule designed to amortize that liability is influenced by the choice of an investment return assumption. PERAC's Actuary, Jim Lamenzo, has been gradually reducing this assumption over the course of the last several years. That development reflects national trends as well as studies authored by investment consultants that analyze future expectations. Once again, PERAC has acted in conjunction with the retirement boards to prudently and responsibly ensure that progress towards funding our pension liabilities continues unabated.

As Chairman of PERAC, it is gratifying to see the hard work of Executive Director Connarton and his staff paying off in improvements that enable all of us to better serve system members and their beneficiaries. We are fortunate to have such intelligent, capable, and dedicated people working on your behalf. The progress reflected in this Report reflects the combined efforts of the retirement boards and PERAC staff to ensure that our pension law is administered in a uniform, efficient, and compassionate manner.

The PROSPER System has been up and running for over a year and the initial implementation of all phases has been completed. Although we continue to work on minor tweaks, a marked improvement in operations has been noted by staff as well as many retirement board members and administrators. This has been particularly evident in the expeditious processing of disability retirements. The system has streamlined this entire process from the establishment of medical panels to the final review and approval. At each stage, the system enables faster action and ultimately benefits the member who is awaiting the result of her or his application. Similarly, the procurement process managed by our Compliance Unit has improved and turnaround time dramatically reduced. We are in the midst of the transition to administering PROSPER internally and hope to complete that task by the end of the year. In the end, PROSPER will enable all of us to better serve retirement system members and their beneficiaries.

We have continued to expand our educational activities by conducting sessions aimed at the practical challenges faced by board administrators across the state. Three well-attended seminars underscored the need for such a program and PERAC has commenced planning for three more such events for later this year. Beyond this, our educational efforts for retirement board members reached a milestone of 10,000 hours completed earlier this year. In this regard, we are most proud of meeting the goal of the reform legislation passed several years ago. Now that our educational program has matured, retirement board members are benefiting from the review of a variety of relevant topics in forums scheduled in convenient locations across the state. We recognize there is more work to do and hope to expand our web based and on-line offerings to further enhance the convenience for those seeking to meet their mandated requirements.

Throughout the Commission's existence, we have issued this Report each year to provide a snapshot of the condition of the public pension systems in Massachusetts. This period has seen market bubbles burst, the emergence of new investment vehicles, legislation revising the benefit structure of Chapter 32, and the arrival of new retirement board members and staff. Through it all, the dedication of those charged with managing the retirement system for the benefit of members and beneficiaries has been a constant. The efforts of these individuals have preserved our defined benefit plan and established a pathway to fiscal security that will maintain these plans far into the future.

On behalf, not only of the Commission, but also the members of each system and their beneficiaries, let me offer sincere congratulations and profound thanks.

Sincerely,



Philip Y. Brown  
Chairman

# Letter from the Executive Director

**“Retirement Board investment performance continued to, in general, meet or exceed expectations.”**



The Commission and staff are pleased to release this Annual Report on the Massachusetts Public Retirement Systems for 2017. Retirement Board investment performance continued to, in general, meet or exceed expectations. This record supports the actions taken by the Commission in establishing investment return assumptions as part of the actuarial process. Investment returns in 2017 again generally compared well with public fund peers across the country and, as has been consistently the case for many years, long-term returns remained, in general, above assumptions.

The national debate regarding the appropriate investment return assumption to be used in actuarial valuations provides the backdrop for analyzing these results. As PERAC Actuary Jim Lamenza constantly reminds us, these are long-range assumptions based on decades of data and not on the experience of one or two years. In light of that fact, Jim and PERAC have led the way in the detailed analysis of investment return projections and the application of those projections to the Massachusetts public pension plans. As recently as 2003, the investment return assumption for 30 of our plans was 8.50%. Today, no plan is using that assumption. In 2003, all assumptions were 7.50% or

greater with only 3 between that level and 7.90%; 52 at 8.00%; 20 between 8.10% and 8.25% and, as noted, 30 used an assumption of 8.50%. Today, 27 plans use an assumption under 7.50%, 73 use a rate of return between 7.50% and 7.90%, and only 4 use a rate of 8.0%. PERAC's evolutionary approach to addressing the investment return assumption has assured that funding progress continues while moderating the fiscal impact of pension costs on state and municipal budgets.

## Commission/Staff Update

Vacant positions in the Audit Unit were filled with the hiring of **Walter Kloc** and **Junior Yanga**. Walter is a Certified Bookkeeper who holds a Bachelor's Degree in Business Administration with over 20 years of accounting and private sector auditing experience, most recently as a Premium Auditor at RLD Associates. Junior holds Bachelor's Degrees in Accounting and Economics and has over 10 years of Accounting and Finance experience. He comes to PERAC after working as a Shareholder Service Specialist with Bank of New York Mellon.

**Robert Perez** assumed the position of Senior Systems Engineer in our Information Technology Unit. Robert has over 20 years of experience as a Systems Network Engineer and System Administrator. Most recently Robert was with New England Baptist Hospital.

In the Actuarial Unit **Michael Humbert** was hired to fill the position of Actuarial Analyst vacated by the departure of Kaitlyn Doucette, who accepted a position with the Methuen Retirement Board. Michael is a graduate of Brandeis University with a Bachelor of Arts Degree in Economics and Mathematics and recently passed the second exam on the road to becoming an Enrolled Actuary.

Also in the Actuarial Unit, **John Boorack** has achieved the status of Enrolled Actuary and Member of the American Academy of Actuaries after successfully completing a series of arduous examinations. John has been a valued member of PERAC's Actuarial Team for more than 20 years. During this time he has worked under the tutelage of the Actuary of the Commonwealth, Jim Lamenza.



As Jim noted, John's task in passing these exams was made more difficult by the fact that much of the material is geared for private sector pension practice and is not applicable for our public sector plans. Understanding the private sector material without working with many of these issues on a daily basis presented John with a unique challenge. We are all pleased with his success.

## Fee Report

PERAC once again published a compilation of the fees paid by the pension systems to investment vendors. The report consisted of the Schedule 7 filed by each Board as part of its Annual Statement of Financial Condition. According to these submissions (some of which were incomplete or needed adjustment) retirement boards paid roughly \$440 million to investment service providers in 2017. For the State and Teachers' funds, which are invested by the Pension Reserves Investment Management Board (PRIM), \$279 million in fees were incurred. Local retirement boards paid \$161 million to money managers, banks and investment consultants, as well as PRIM.



**2017 Investment Report, compiled by PERAC, of fees paid by pension systems to investment vendors.**

The Annual Fee Report enables retirement boards to make comparisons between fees the board pays in connection with a particular manager or fund and the

fee other boards pay in connection with the same manager or fund. Armed with that information, a board can discern discrepancies between fee schedules and hopefully realize savings in the event it is paying more than its peers for the same service or product.

The level of cost in and of itself is neither a positive or negative but must be assessed in the context of returns as performance may justify cost.

It should also be emphasized that retirement boards must conduct their own analysis of the fees paid or expected to be paid in connection with investment activities. Over the last few years, our analysis has found that service providers often are unclear about not only the costs to the system but also the manner in which payment is made.

## Contract Compliance

As you know, the original limit on the time frame for contracts set forth in Section 23B was expanded from five years to seven years by Chapter 46 of the Acts of 2015. That period is now coming to an end and boards should review the existing time frames for contracts and institute a program to conduct and complete searches before the new deadline. April 2019 will mark the outer limit for existing relationships, as seven years will have elapsed since the effective date of Chapter 176 of the Acts of 2011.

## Accounting

Consistent with the need to insure accurate recordkeeping by retirement boards, PERAC has made several revisions to its accounting procedures that will be applicable beginning in calendar 2018. These include accounting for fees paid in conjunction with investment activity, as well as the tracking of "carried interest", "catch up payments" and "ancillary expenses" related to private equity, hedge fund, real estate, and similar investment vehicles.

Retirement boards are also reminded of their duty to submit complete and accurate cash books to PERAC on a timely basis. Accounting standards require that transactions be accurately identified and properly classified. The parties to whom payments are made, or from whom payments are received, must be identified and all transactions must be classified in the proper account.

Unfortunately, a number of systems have established a pattern of failing to comply with regulatory deadlines pertaining to these submissions, incorrect classification of accounts, as well as transactions. The Commission's past practice has been to work with the retirement board to resolve these matters. However, in some cases, the failings are so pervasive that in the future Orders to Protect the System will be considered to ensure the safety of system assets.

## Emerging Issues Forum

PERAC held its Thirteenth Emerging Issues Forum at the College of the Holy Cross in September, 2017. Over 260 people participated and board members attending received three educational credits. In the keynote address, State Auditor Suzanne Bump elaborated upon recent technology upgrades at her office. Her perspective was most helpful, particularly in the context of the Commission roll out of the PROSPER system.



**Keynote speaker State Auditor and PERAC Vice Chair, Suzanne Bump**

Michael Trotsky of PRIM and Jim Lamenzo, PERAC's Actuary, led the session on Actuarial and Investment Perspectives. Providing some insight on the contentious issue of actuarial investment return assumptions, Michael provided the latest information on the PRIT Fund asset allocation and market analysis while Jim detailed his thinking regarding the appropriate methodology to be employed when setting that assumption.



**PERAC Chairman, Phil Brown moderates the Retirement System Best Practices Panel**

Although all of the presentations were excellent, the highlight of the day was the initial Retirement System Best Practices panel. The Panel featured four executive directors representing the various board sizes and types. Susana Baltazar of the Springfield Retirement System discussed her board's recent venture into digital board materials and how they have integrated PROSPER into their business practices. Lauren Durham, of the Hull Retirement System, gave an overview of the challenges faced by smaller boards, particularly with recruiting and retaining board members. Lisa Maloney, of the Middlesex County Retirement System, discussed change management and her experience coming into an established larger system. Irene Moran, of the MassPort Retirement System, gave an overview of the Comprehensive Annual Financial Report and its benefits. She brought along fantastic examples of past MassPort CAFRS.

The final session of the day, Pension Forfeiture: A Case for Change, discussed the outcome and recommendations from the Pension Forfeiture Commission. The panel consisted of several Commission members and its legal counsel: PERAC Executive Director, Joe Connarton, Norfolk County District Attorney, Mike Morrissey, Massachusetts Deputy Treasurer and State Retirement Board Executive Director, Nick Favorito, and PERAC Associate General Counsel, Patrick Charles. The presenters laid out the case for updating the existing law to increase equity and presented the issue from varying points of view.



**Lt. Governor Karyn Polito providing opening remarks at PERAC's 13th Emerging Issues Forum**

## PROSPER

The full roll out of the PROSPER System is now complete, although we will be adding features and fine-tuning the program as we go forward. To date, boards seem pleased in general with the system and, in particular, it is the consensus that the Disability Application has simplified and expedited the disability process. Compliance has also been working hard to ensure that refinements take place to improve vendor disclosure filing, education tracking, and course registration. The application regarding Vendor Procurement seems to have made that task more user-friendly. We firmly believe that we are well on our way to a dramatic simplification of our interaction with board administrators, board members, and vendors.

## Education

One of the true success stories of recent years has been the implementation of the mandatory education provisions of Chapter 176. Through its sixth year, that program has seen more than 10,000 course completions by retirement board members. These include 5,062 attendees at PERAC approved conferences including MACRS, 2,158 attendees at stand-alone PERAC events, 1,311 completions of Ethics Commission and Attorney General courses, and 153 completions of webinars.



**Through its 6th year, the mandatory education provisions of Chapter 176 has seen more than 10,000 course completions by retirement board members.**

In 2017, we launched a new program of one-day Board Administrator Trainings. Sessions were held in Northampton, Hyannis, and Danvers. All told, over 125 board administrators and board members attended one of the three sessions. Although geared toward the specific needs of board administrators, board members were welcome to attend and earned three credits for their attendance at this day-long seminar. Members of the Actuarial Unit, the Compliance Unit, and the Legal Unit at PERAC served as presenters. Many topics were covered in the course of each session. Attendees learned about "Calculations," "Anti-Spiking," "Running a Board Meeting," "Regular (and Irregular) Compensation," "Dual Members," "Buybacks," and "Interest." (The "Buyback" presentation also covered the different ways in which a member may be credited with previous, non-membership time.) Each day of training concluded with the award of certificates to all attendees.

We are finalizing plans for similar events to be held prior to the end of this year.

## Legislation

On the legislative front, 2017 saw the adoption of legislation recommended by the Commission that repealed Section 90G<sup>3/4</sup> of Chapter 32. That statute had required that an employee who had reached the age of 70 and wished to continue to accrue creditable service after that age and receive regular compensation had to elect to do so. As a result of this change, members simply continue making contributions and accruing creditable service after age 70 with no change in the pre-tax status of their contributions.

## Conclusion

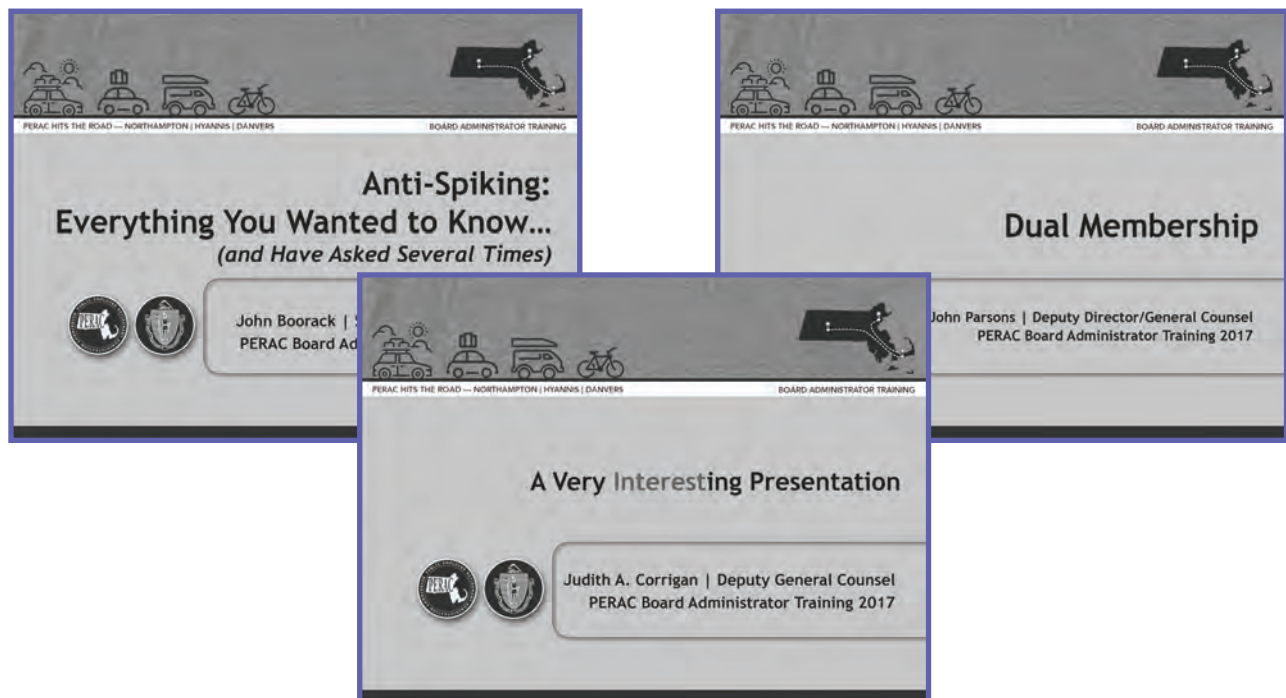
This year has been a challenging one as we instituted a complex and unprecedented system for interaction with the retirement boards, aggressively defended the pension system against ill-informed and sometimes malicious attacks, and sought to maintain progress towards fully funding retirement benefits. On all fronts we have been largely successful. However, recently there

has developed an antagonism towards the Commission that has been grounded not solely on honest disagreement but seems to be virulent and almost personal in nature. The Commission has worked to establish a cooperative and helpful relationship with the retirement community. We believe that, in general, that effort has been supported by the retirement boards and others in the pension community. It is our hope that as we move forward the interests of the members and their beneficiaries will remain paramount to all involved.

Sincerely,

*Joseph E. Connarton*

Joseph E. Connarton  
Executive Director



**Over 125 board administrators and board members attended one of our three Board Administrator Trainings covering 7 topics in 2017.**

# Massachusetts Contributory Retirement Board Profiles

**The Board Profile section of the PERAC Annual Report provides a detailed assessment of some of the important indicators relative to the financial health of the retirement systems.**

## Introduction

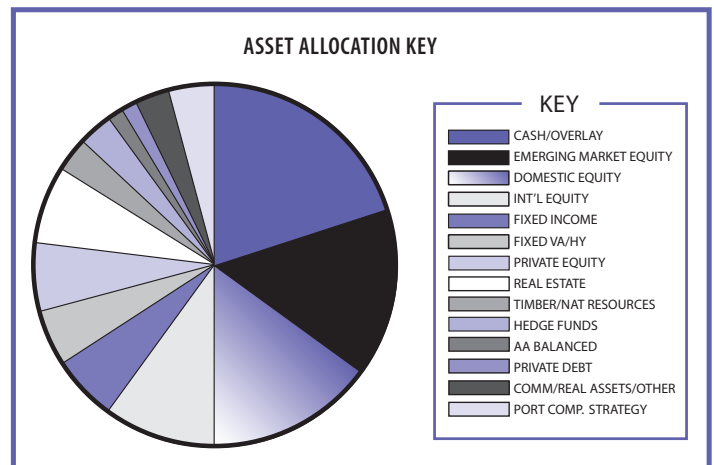
The Board Profile section of the PERAC Annual Report provides a detailed assessment of some of the important indicators relative to the financial health of the retirement systems. The information provided in this report can enable board members to provide factual comment and advice to policymakers as various proposals relative to the retirement law are assessed. Through this and other studies, the Commission seeks to provide objective, comprehensive, and accurate data for use by all interested parties.

## A Word on Portfolio Valuations

In assessing investment performance, PERAC relies on the retirement boards to submit accurate and complete information about investment activity. PERAC numbers might differ from those provided to a board by its consultant because PERAC measures all assets, including monies not committed to investment management.

Asset allocation is presented in graph form. The way a board allocates its assets among the various investment classes available to it has long been recognized as the prime determining factor in the generation of returns. Allocation information reported by the investment consultants advising the retirement boards or PRIM forms the basis of these graphs. PERAC has not independently confirmed the accuracy of this data.

The key used for the Asset Allocation graphs is shown below.



## Actuarial

As always, actuarial information details the fiscal condition of the systems, which can play a direct role in state and local budgets. The funded ratio indicates the extent to which assets cover system liabilities. When the system will pay off its unfunded liability and what type of funding technique is being used are also noted. PERAC has consistently urged boards to conduct actuarial valuations in order to provide an up-to-date assessment of the fiscal condition of the system.

The Funding Schedule item reflects the amortization schedule for the Unfunded Actuarial Liability (UAL). For example, 1.5% increasing with a year fully funded of 2030 means the UAL is being amortized on a 1.5% annually increasing basis to FY30.

A number of systems utilize phase-in schedules in which payments increase more rapidly over the first few years of the schedule than later in the schedule. We reflect those schedules using the ultimate amortization schedule and note there is a phase-in. For example, 4.0% Increasing Phase-In with a year fully funded of 2035 means



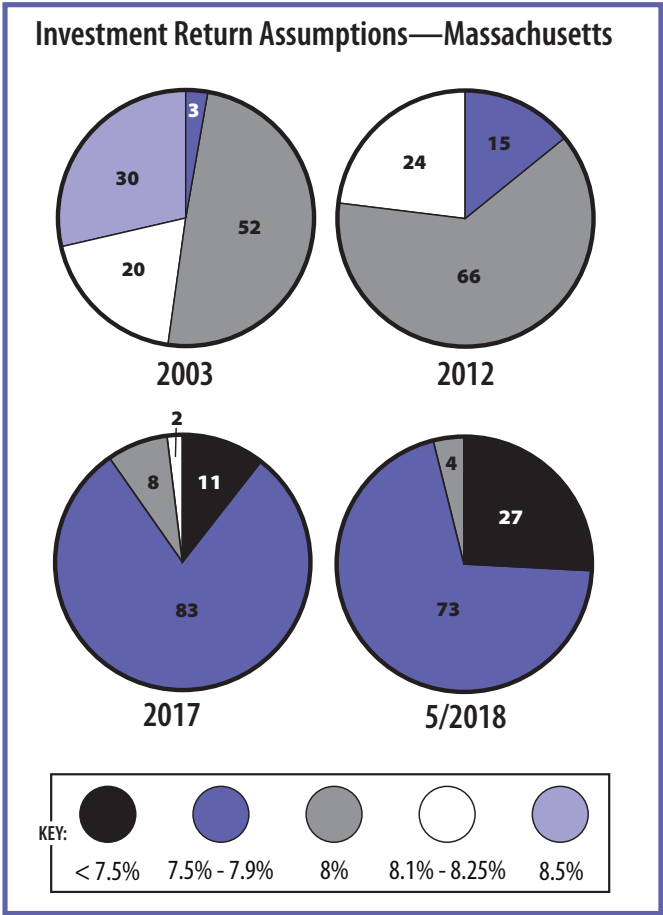
the total appropriation increases by a certain percent per year for a period of time and then the remaining unfunded liability is amortized on a 4.0% annual increasing basis until FY35. Fifteen systems currently use a phase-in approach and both the percentage increase and number of years before the amortization begins vary.

Schedules described as “Total Increasing” mean the annual appropriation increases by the amount indicated, which may vary, for the entire schedule. Sixty-two systems have such a schedule. In total, three-quarters of systems utilize a phase-in and/or total increasing schedule.

We have not reflected any 2018 valuation results in this report.

In the actuarial area, PERAC approved 46 revised funding schedules and completed 22 actuarial valuations in 2017. The valuations complemented the 24 valuations performed by private actuaries. The Actuarial Unit also completed the annual actuarial valuation of the Commonwealth’s pension liability. Throughout the year, PERAC responded to legislative and gubernatorial requests for analysis of legislation and made presentations at several forums.

The Massachusetts Investment Return Assumptions from 2003 to present is illustrated below.



**Legal Unit**

PERAC’s Legal Unit, in addition to representing the Commission at all levels including the Supreme Judicial Court, issued 202 Legal Opinions and reviewed 506 disabilities in 2017.

**Medical Panels/Post-Retirement Earnings**

In addition to the information detailed in the Profiles, PERAC, as always, has been busy assisting the boards in other areas. In 2017, 523 medical panel requests were processed and 1,315 comprehensive medical evaluations were conducted. This led to the approval of 456 disability applications and 53 accidental death claims. 22 medical re-examinations of disability retirees took place. Such medical evaluations and examinations resulted in 1 member returning to work, saving \$59,079.72.

**22 medical re-examinations of disability retirees took place. Such medical evaluations and examinations resulted in 1 member returning to work, saving \$59,079.72.**

PERAC is responsible for the post-retirement monitoring of disabled retirees. One aspect of that task is enforcing the earnings limits set forth in Chapter 32. In 2017, PERAC analyzed 15,576 earnings reports, 3,720 retirees reported earnings and 59 earned in excess of the statutory limits. An additional 135 retirees failed to comply with the reporting requirement. This resulted in the identification of \$858,781 in excess earnings and \$4,418,189 for non-compliance. In addition 21 retirees waived their allowance saving \$400,867.

No members’ retirement benefit was modified under the Commission’s Modification Policy in 2017. This review, to date, has resulted in the modifications of 15 member retirement allowances. Savings due to that action total \$299,967 annually.

**Audits**

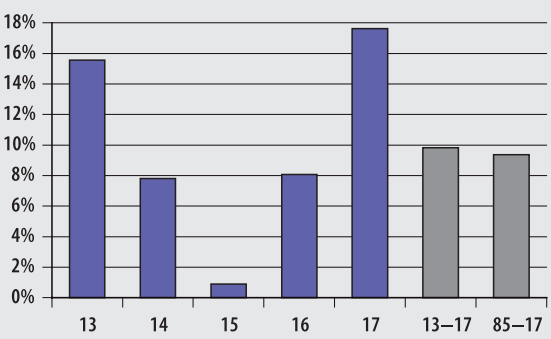
In 2017, PERAC published 23 audits of retirement systems. In addition, 14 follow-up audits were issued. In the last few years the Commission has awarded Certificates of Achievement to those systems found by our auditors to be operating in an exemplary fashion. In 2017 we issued 3 Certificates of Achievement. As always, PERAC audit staff conducted annual seminars on the preparation of the Annual Statement.

**DISCLAIMER:** In publishing this information PERAC makes no comment regarding any retirement boards’ asset allocation, investment strategy or manager/fund commitments.

COMPOSITE INVESTMENT PROFILE

- ▶ Commonwealth of Massachusetts
- ▶ Public Employee Retirement Systems and Pension Reserves Investment Trust

INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



INVESTMENT

▶ 2017 Return	17.63%
▶ 2017 Market Value	\$87.3 B
▶ 2013-2017 (Annualized)	9.83%
▶ 1985-2017 (Annualized)	9.36%

## Adams

Adams Visitor Center  
3 Hoosac Street  
Adams, MA 01220  
Phone 413-743-5575  
Fax 413-743-2815

### Board Members

Mary Beverly, George Haddad,  
Beth Matson, Allen Mendel,  
Patricia Wol

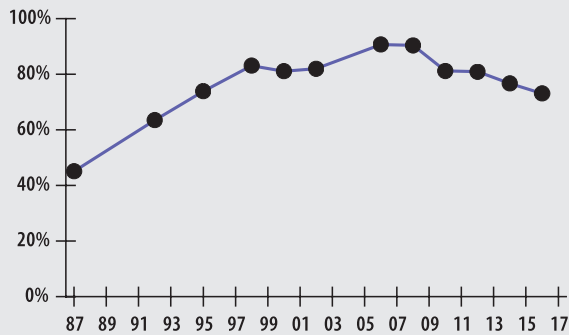
### Board Administrator

Cheryl J. DeMarsico

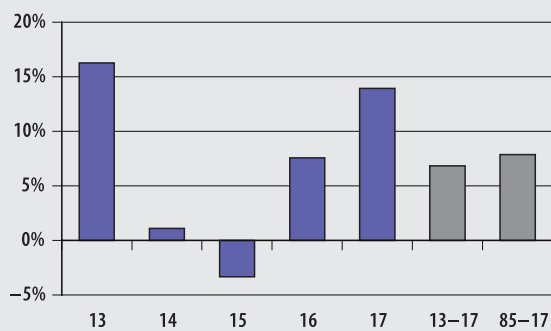
### Board Meeting

Fourth Monday of each month at 4:00 pm

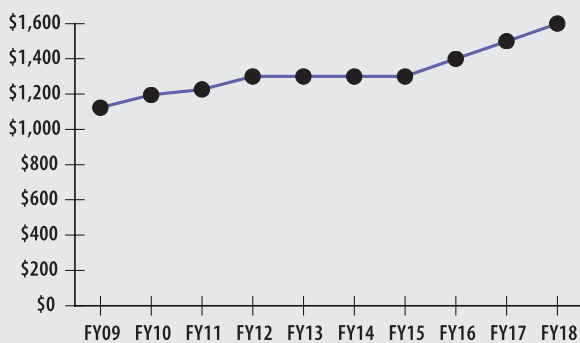
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
7.87%

**32 years 2016**  
7.69%

**31 years 2015**  
7.69%

**10 years 2017**  
4.53%

**10 years 2016**  
3.96%

**10 years 2015**  
4.04%

**5 years 2017**  
6.86%

**5 years 2016**  
5.94%

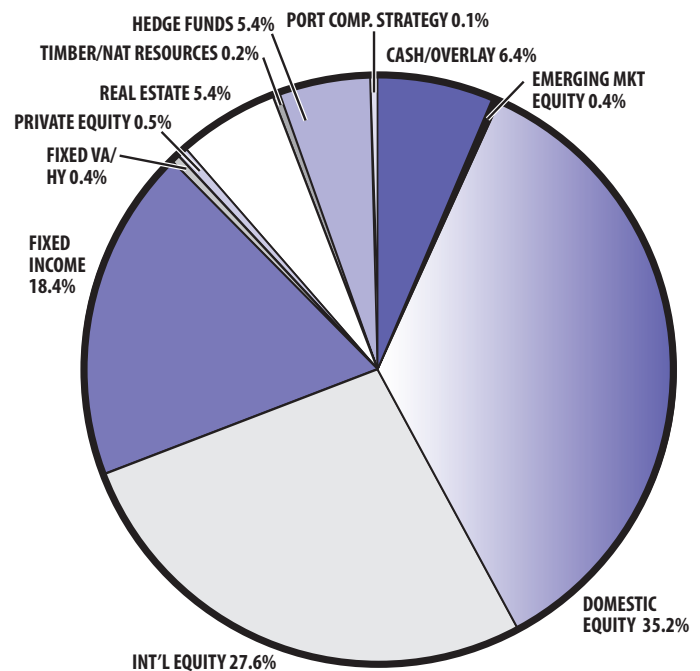
**5 years 2015**  
4.66%

## ACTUARIAL

▶ Funded Ratio	73.1%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.00%
▶ Funding Schedule	5.0% Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$12.4 M
▶ Total Pension Appropriation (Fiscal 2018)	\$1.6 M

	ACTIVE	RETIRED
▶ Number of Members	186	146
▶ Total Payroll/Benefit	\$6.3 M	\$2.5 M
▶ Average Salary/Benefit	\$33,800	\$17,000
▶ Average Age	48	73
▶ Average Service	12.2 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	6
▶ Number Who Reported Earnings	1
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	13.96%
▶ 2017 Market Value	\$34.2 M
▶ 2013-2017 (Annualized)	6.86%
▶ 1985-2017 (Annualized)	7.87%

## Amesbury

City Hall  
62 Friend Street  
Amesbury, MA 01913-2825  
Phone 978-388-8131  
Fax 978-388-6727

### Board Members

Donna Cornoni (Chairperson),  
Michael Cronin, Bonniyo Kitchin,  
James L. Lynch, Jr., David S. Van Dam

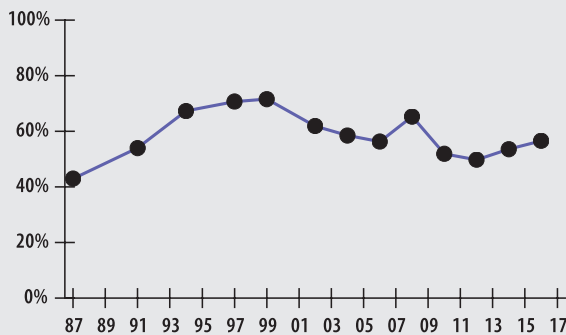
### Board Administrator

Kevin Caira

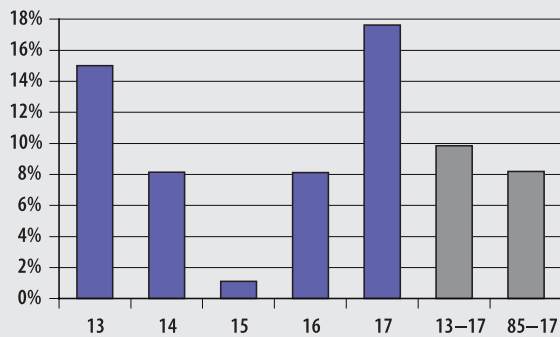
### Board Meeting

Last Thursday of each month at 1:30 pm

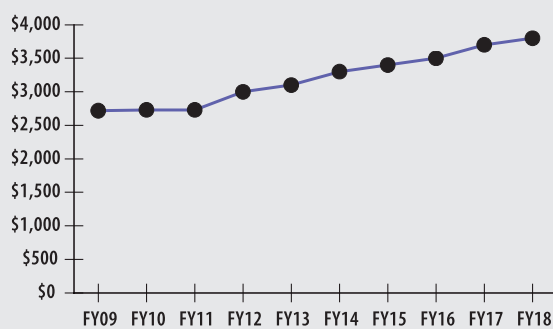
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.20%

**32 years 2016**  
7.92%

**31 years 2015**  
7.92%

**10 years 2017**  
5.63%

**10 years 2016**  
4.84%

**10 years 2015**  
5.47%

**5 years 2017**  
9.85%

**5 years 2016**  
9.14%

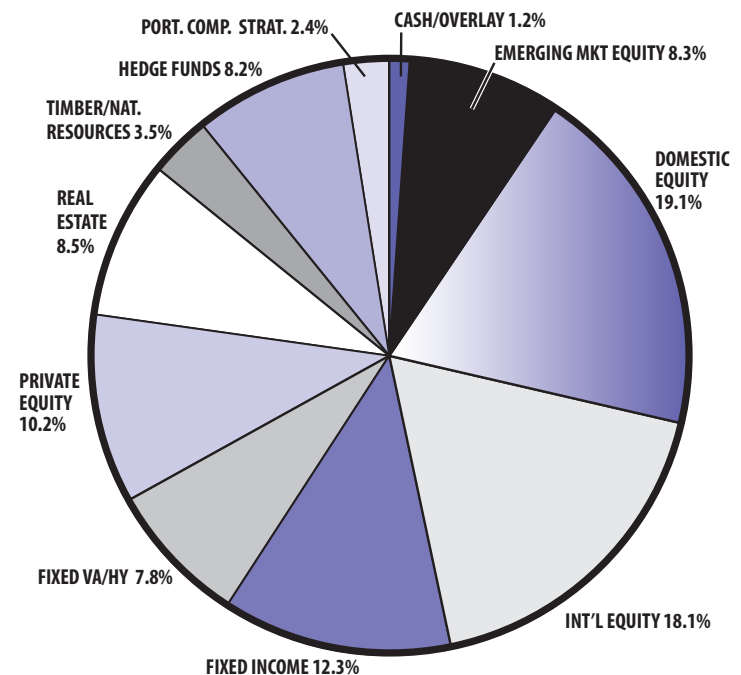
**5 years 2015**  
7.46%

## ACTUARIAL

▶ Funded Ratio	56.6%
▶ Date of Last Valuation	01/16
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.0% Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$38.2 M
▶ Total Pension Appropriation (Fiscal 2018)	\$3.8 M

	ACTIVE	RETIRED
▶ Number of Members	266	242
▶ Total Payroll/Benefit	\$13.4 M	\$5.5 M
▶ Average Salary/Benefit	\$50,500	\$22,900
▶ Average Age	NA	73
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	14
▶ Number Who Reported Earnings	6
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.63%
▶ 2017 Market Value	\$57.6 M
▶ 2013-2017 (Annualized)	9.85%
▶ 1985-2017 (Annualized)	8.20%



## Andover

Town Offices  
36 Bartlet Street  
Andover, MA 01810  
Phone 978-623-8540  
Fax 978-623-8594

### Board Members

James A. Cuticchia (Chairperson),  
Gary M. Coon, Haley Green,  
Elena M. Kothman, Thomas P. Hartwell

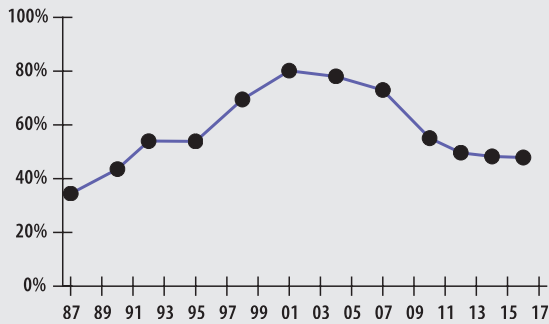
### Board Administrator

Elena M. Kothman

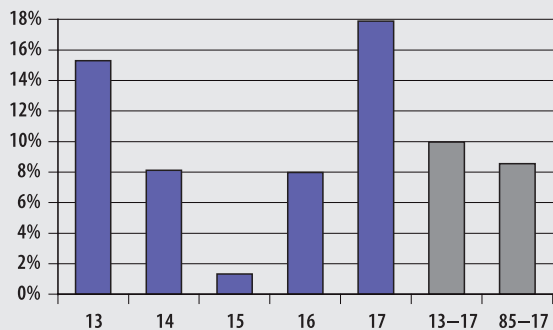
### Board Meeting

Day and date vary

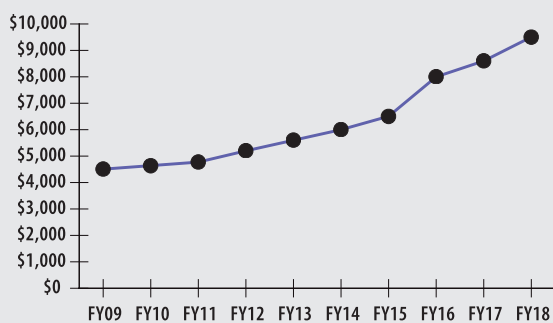
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

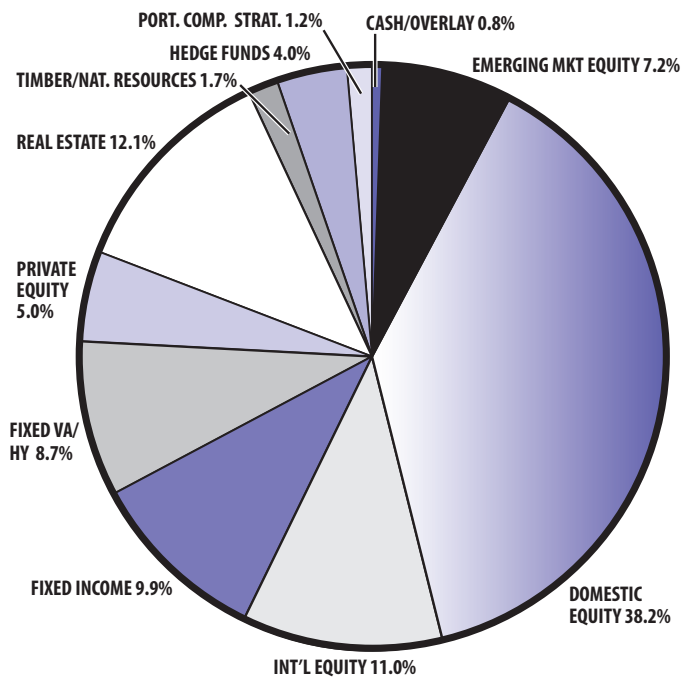
<b>33 years 2017</b>	<b>32 years 2016</b>	<b>31 years 2015</b>
8.56%	8.28%	8.29%
<b>10 years 2017</b>	<b>10 years 2016</b>	<b>10 years 2015</b>
5.66%	4.46%	5.06%
<b>5 years 2017</b>	<b>5 years 2016</b>	<b>5 years 2015</b>
9.97%	9.19%	7.59%

## ACTUARIAL

▶ Funded Ratio	47.9%
▶ Date of Last Valuation	01/16
▶ Actuary	Segal
▶ Assumed Rate of Return	7.25%
▶ Funding Schedule	10.0% Total Increasing
▶ Year Fully Funded	2032
▶ Unfunded Liability	\$128.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$9.5 M

	ACTIVE	RETIRED
▶ Number of Members	728	432
▶ Total Payroll/Benefit	\$38.6 M	\$12.3 M
▶ Average Salary/Benefit	\$53,000	\$28,500
▶ Average Age	49	NA
▶ Average Service	12.7 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	38
▶ Number Who Reported Earnings	9
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.90%
▶ 2017 Market Value	\$143.8 M
▶ 2013-2017 (Annualized)	9.97%
▶ 1985-2017 (Annualized)	8.56%

## Arlington

27 Maple Street, Suite G-11  
Arlington, MA 02476-4701  
Phone 781-316-3370  
Fax 781-316-3379

### Board Members

John J. Bilafer (Chairperson)  
Ida Cody, Kenneth Hughes,  
Richard Keshian, Ken Steele

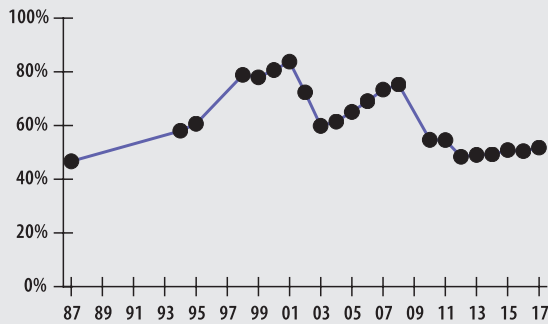
### Board Administrator

Richard Greco

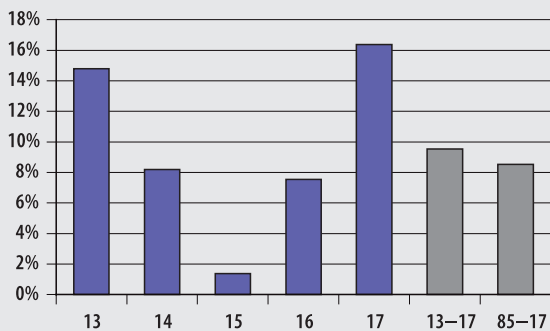
### Board Meeting

Last Thursday of the month

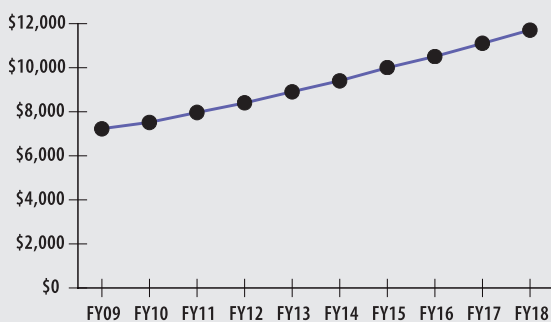
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

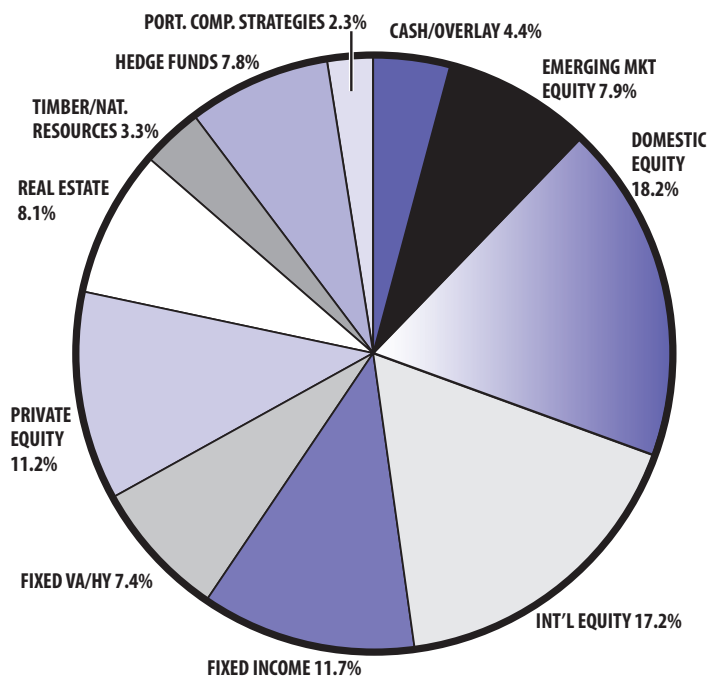
<b>33 years 2017</b> 8.53%	<b>32 years 2016</b> 8.29%	<b>31 years 2015</b> 8.32%
<b>10 years 2017</b> 4.90%	<b>10 years 2016</b> 3.80%	<b>10 years 2015</b> 4.45%
<b>5 years 2017</b> 9.53%	<b>5 years 2016</b> 8.86%	<b>5 years 2015</b> 7.54%

## ACTUARIAL

▶ Funded Ratio	51.8%
▶ Date of Last Valuation	01/17
▶ Actuary	Stone
▶ Assumed Rate of Return	7.25%
▶ Funding Schedule	5.5% Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$133.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$11.7 M

	ACTIVE	RETIRED
▶ Number of Members	720	603
▶ Total Payroll/Benefit	\$36.8 M	\$17.3 M
▶ Average Salary/Benefit	\$51,100	\$28,600
▶ Average Age	47	75
▶ Average Service	10.6 years	NA

## ASSET ALLOCATION (12/31/17)

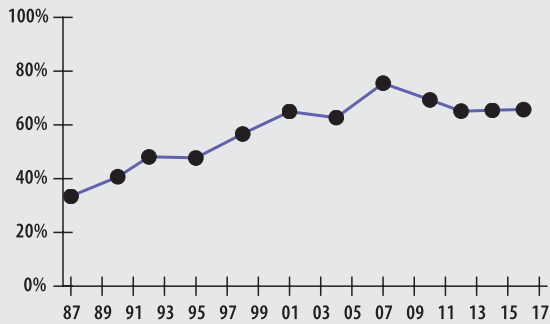


## EARNED INCOME OF DISABILITY RETIREES (2016)

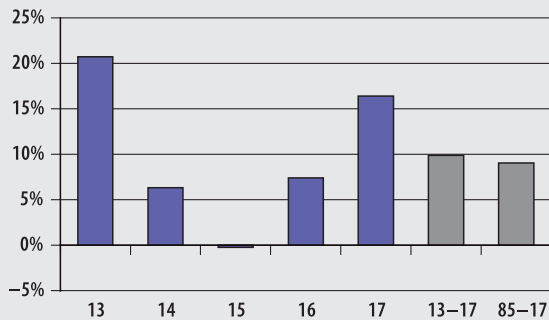
▶ Number of Disability Retirees	90
▶ Number Who Reported Earnings	17
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	16.39%
▶ 2017 Market Value	158.1 M
▶ 2013-2017 (Annualized)	9.53%
▶ 1985-2017 (Annualized)	8.53%

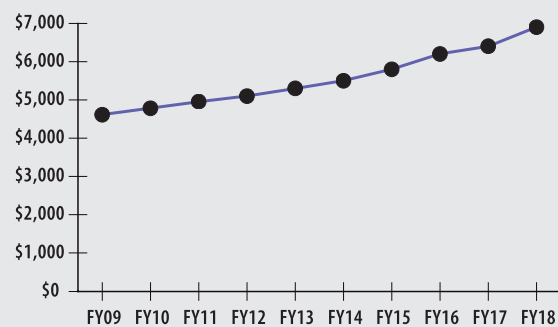
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 9.04%	<b>32 years 2016</b> 8.82%	<b>31 years 2015</b> 8.87%
<b>10 years 2017</b> 6.40%	<b>10 years 2016</b> 5.64%	<b>10 years 2015</b> 6.19%
<b>5 years 2017</b> 9.88%	<b>5 years 2016</b> 9.40%	<b>5 years 2015</b> 7.94%

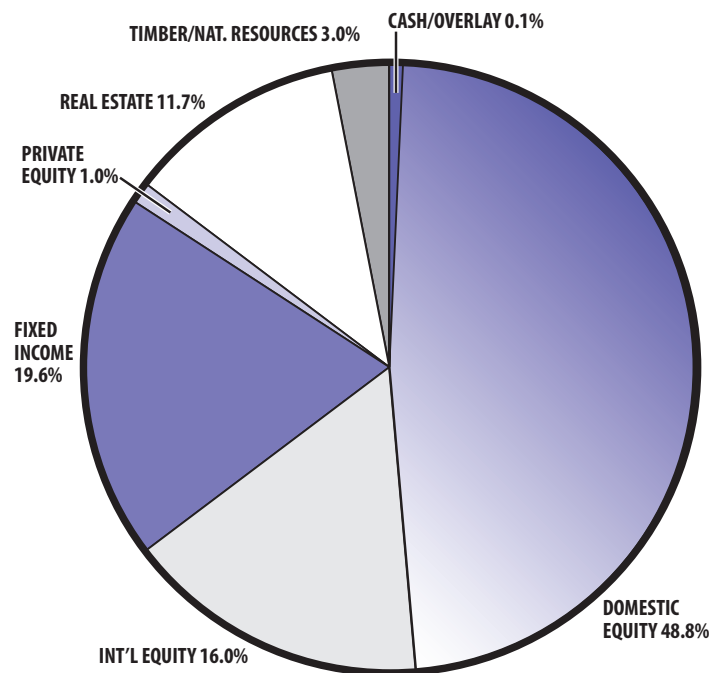
### ACTUARIAL

▶ Funded Ratio	65.7%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.88%
▶ Funding Schedule	4.0% Increasing
▶ Year Fully Funded	2037
▶ Unfunded Liability	\$68.2 M
▶ Total Pension Appropriation (Fiscal 2018)	\$6.9 M

	ACTIVE	RETIRED
▶ Number of Members	630	415
▶ Total Payroll/Benefit	\$32.0 M	\$10.8 M
▶ Average Salary/Benefit	\$50,800	\$26,000
▶ Average Age	48	72
▶ Average Service	13.1 years	NA

### ASSET ALLOCATION (12/31/17)

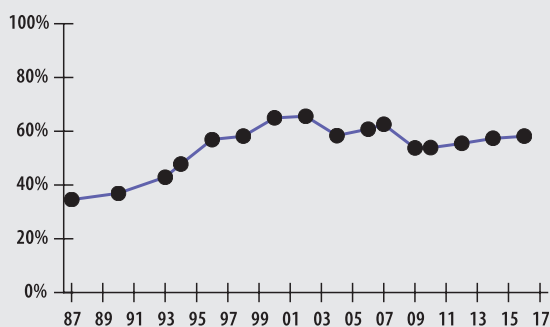


### EARNED INCOME OF DISABILITY RETIREES (2016)

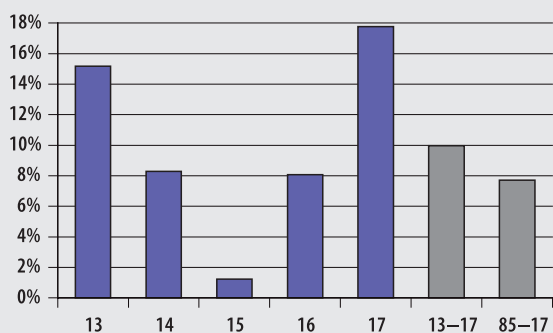
▶ Number of Disability Retirees	48
▶ Number Who Reported Earnings	9
▶ Number of Excess Earners	1
▶ Total Amount of Refund Due	\$7,561.27

▶ 2017 Return	16.41%
▶ 2017 Market Value	\$148.2 M
▶ 2013-2017 (Annualized)	9.88%
▶ 1985-2017 (Annualized)	9.04%

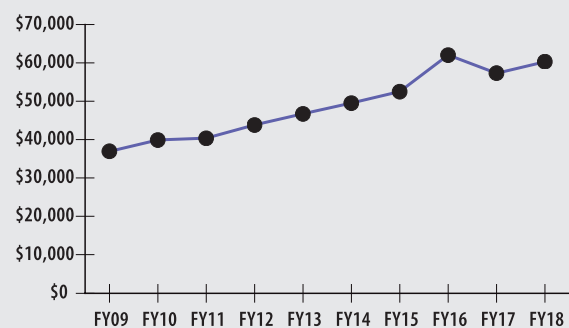
#### FUNDED RATIO (1987-2017)



#### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



#### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



#### INVESTMENT RETURN HISTORY

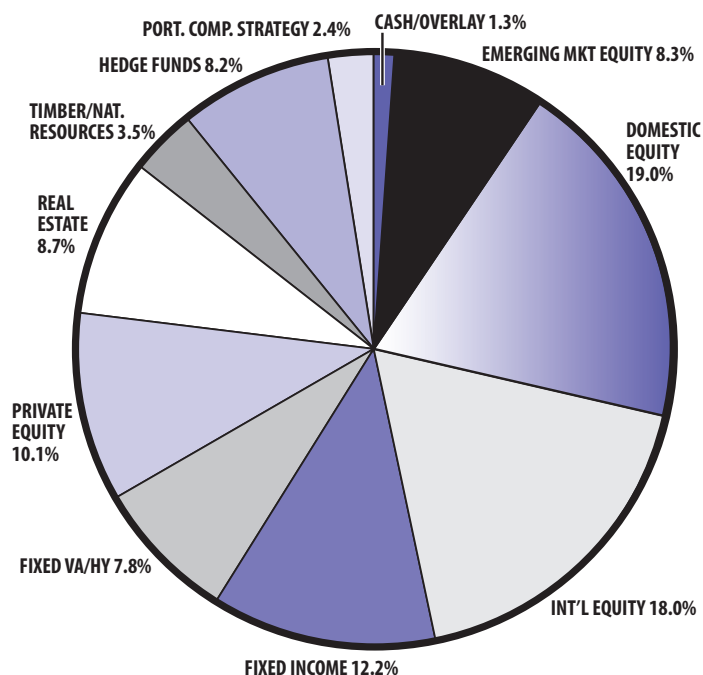
<b>33 years 2017</b> 7.71%	<b>32 years 2016</b> 7.41%	<b>31 years 2015</b> 7.39%
<b>10 years 2017</b> 5.61%	<b>10 years 2016</b> 4.82%	<b>10 years 2015</b> 5.41%
<b>5 years 2017</b> 9.96%	<b>5 years 2016</b> 9.23%	<b>5 years 2015</b> 7.62%

#### ACTUARIAL

▶ Funded Ratio	58.2%
▶ Date of Last Valuation	01/16
▶ Actuary	Segal
▶ Assumed Rate of Return	7.63%
▶ Funding Schedule	5.28% Total Increasing
▶ Year Fully Funded	2036
▶ Unfunded Liability	\$653.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$60.3 M

	ACTIVE	RETIRED
▶ Number of Members	4,699	2,937
▶ Total Payroll/Benefit	\$269.7 M	\$73.6 M
▶ Average Salary/Benefit	\$57,400	\$25,000
▶ Average Age	49	NA
▶ Average Service	12.2 years	NA

#### ASSET ALLOCATION (12/31/17)



#### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	372
▶ Number Who Reported Earnings	123
▶ Number of Excess Earners	3
▶ Total Amount of Refund Due	\$79,812.53

▶ 2017 Return	17.78%
▶ 2017 Market Value	\$1.1 B
▶ 2013-2017 (Annualized)	9.96%
▶ 1985-2017 (Annualized)	7.71%

## Belmont

Town Hall  
90 Concord Avenue, 3rd Floor, Suite 3  
Belmont, MA 02478-0900  
Phone 617-993-2792  
Fax 617-993-2793

### Board Members

Thomas F. Gibson, Esq. (Chairperson),  
Floyd Carman, Chitra Subramanian,  
Ross Vona, Walter D. Wellman

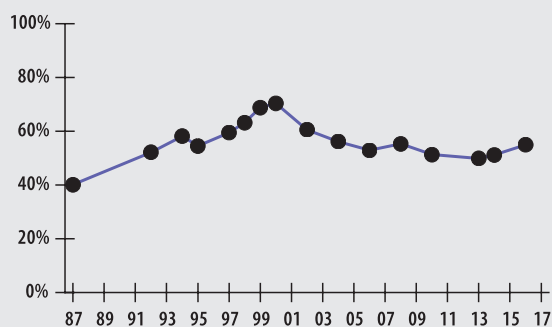
### Board Administrator

Robert Soohoo

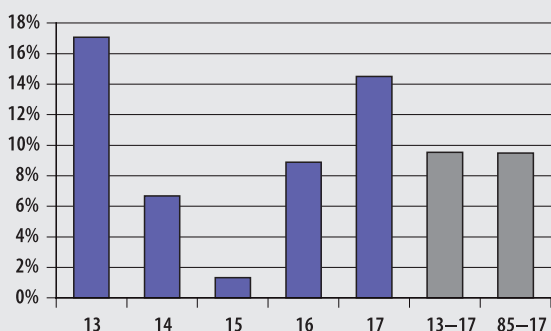
### Board Meeting

Varies

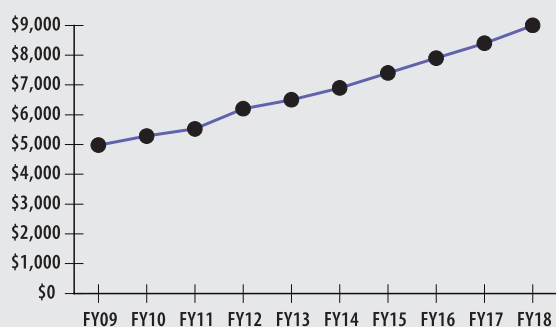
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.49%

#### 32 years 2016

9.34%

#### 31 years 2015

9.35%

#### 10 years 2017

7.35%

#### 10 years 2016

6.99%

#### 10 years 2015

7.59%

#### 5 years 2017

9.55%

#### 5 years 2016

9.27%

#### 5 years 2015

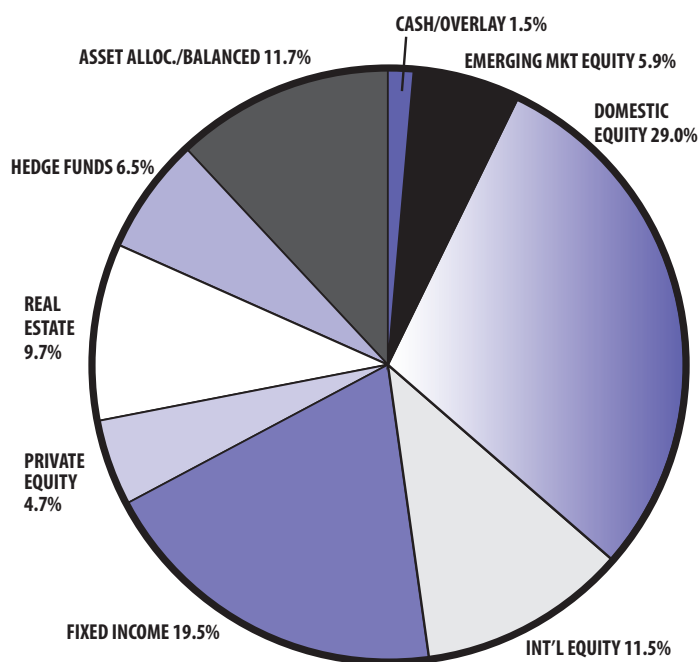
7.95%

## ACTUARIAL

▶ Funded Ratio	55.0%
▶ Date of Last Valuation	01/16
▶ Actuary	Segal
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2029
▶ Unfunded Liability	\$73.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$9.0 M

	ACTIVE	RETIRED
▶ Number of Members	460	348
▶ Total Payroll/Benefit	\$25.0 M	\$10.0 M
▶ Average Salary/Benefit	\$54,400	\$28,700
▶ Average Age	46	74
▶ Average Service	11.7 years	NA

## ASSET ALLOCATION (12/31/17)

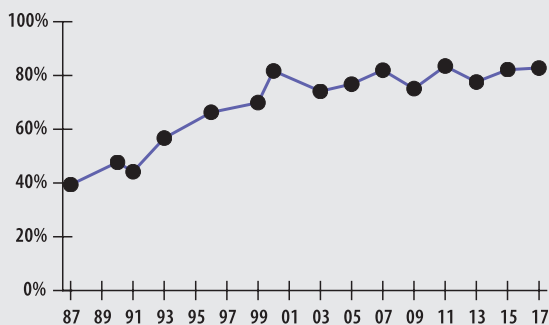


## EARNED INCOME OF DISABILITY RETIREES (2016)

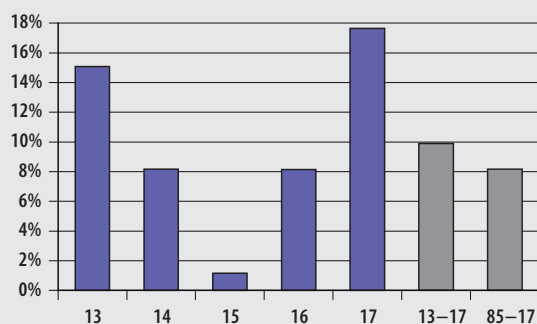
▶ Number of Disability Retirees	42
▶ Number Who Reported Earnings	9
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	14.50%
▶ 2017 Market Value	\$104.9 M
▶ 2013-2017 (Annualized)	9.55%
▶ 1985-2017 (Annualized)	9.49%

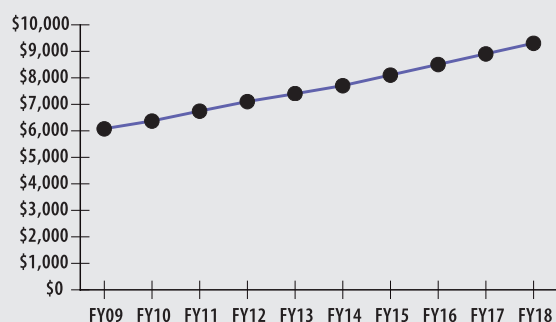
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

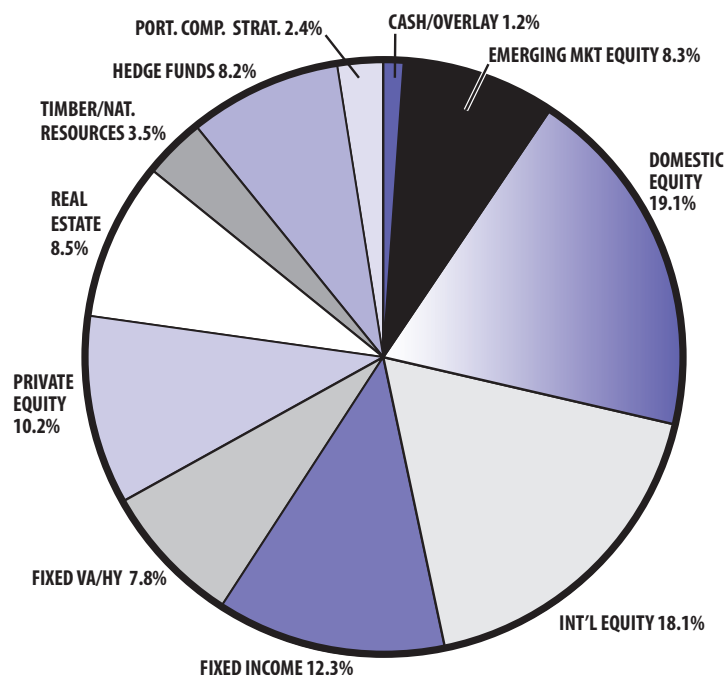
<b>33 years 2017</b> 9.18%	<b>32 years 2016</b> 8.92%	<b>31 years 2015</b> 8.95%
<b>10 years 2017</b> 5.62%	<b>10 years 2016</b> 5.10%	<b>10 years 2015</b> 5.90%
<b>5 years 2017</b> 9.89%	<b>5 years 2016</b> 9.13%	<b>5 years 2015</b> 7.50%

## ACTUARIAL

▶ Funded Ratio	82.8%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.25%
▶ Funding Schedule	4.7% Total Increasing
▶ Year Fully Funded	2028
▶ Unfunded Liability	\$44.5 M
▶ Total Pension Appropriation (Fiscal 2018)	\$9.3 M

	ACTIVE	RETIRED
▶ Number of Members	1,142	778
▶ Total Payroll/Benefit	\$43.7 M	\$13.3 M
▶ Average Salary/Benefit	\$38,300	\$17,100
▶ Average Age	50	74
▶ Average Service	11.2 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	27
▶ Number Who Reported Earnings	6
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.65%
▶ 2017 Market Value	\$242.2 M
▶ 2013-2017 (Annualized)	9.89%
▶ 1985-2017 (Annualized)	9.18%

## Beverly

City Hall  
191 Cabot Street  
Beverly, MA 01915  
Phone 978-605-2370  
Fax 978-921-8582

### Board Members

Richard F. Pierce (Chairperson),  
Carol I. Augulewicz, Bryant Ayles,  
Charles Kostro, Kevin D. Smith

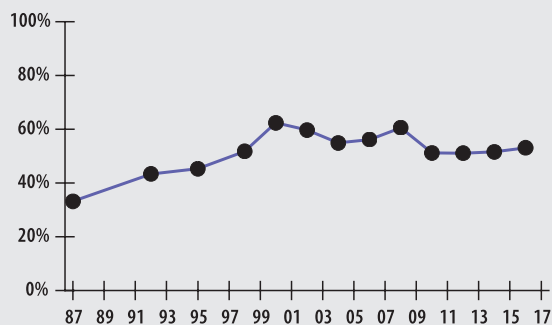
### Board Administrator

Barbara Wells

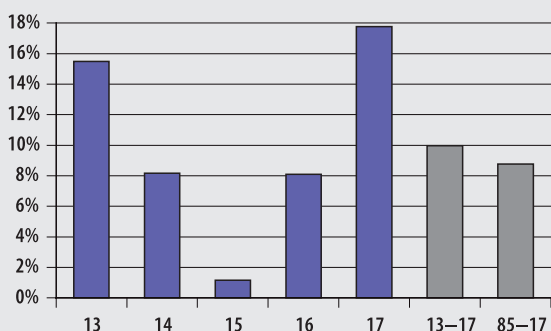
### Board Meeting

Last Thursday of each month

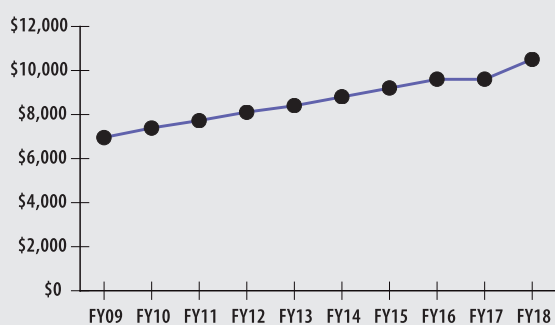
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

8.76%

#### 32 years 2016

8.49%

#### 31 years 2015

8.50%

#### 10 years 2017

5.71%

#### 10 years 2016

4.92%

#### 10 years 2015

4.86%

#### 5 years 2017

9.98%

#### 5 years 2016

9.34%

#### 5 years 2015

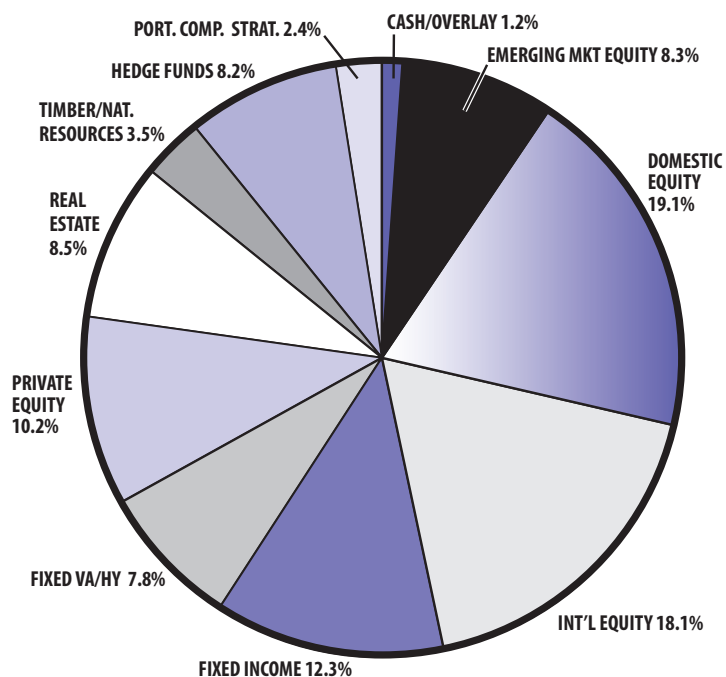
7.70%

## ACTUARIAL

▶ Funded Ratio	53.1%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	4.45% Total Increasing
▶ Year Fully Funded	2033
▶ Unfunded Liability	\$92.3 M
▶ Total Pension Appropriation (Fiscal 2018)	\$10.5 M

	ACTIVE	RETIRED
▶ Number of Members	576	448
▶ Total Payroll/Benefit	\$27.5 M	\$12.0 M
▶ Average Salary/Benefit	\$47,700	\$26,800
▶ Average Age	49	73
▶ Average Service	11.6 years	NA

## ASSET ALLOCATION (12/31/17)

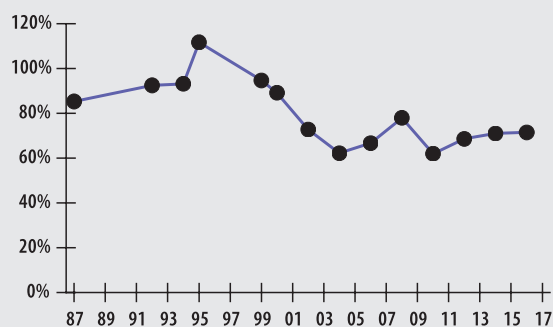


## EARNED INCOME OF DISABILITY RETIREES (2016)

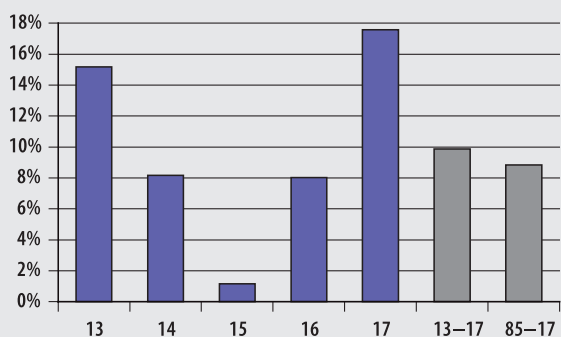
▶ Number of Disability Retirees	59
▶ Number Who Reported Earnings	12
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.78%
▶ 2017 Market Value	\$124.4 M
▶ 2013-2017 (Annualized)	9.98%
▶ 1985-2017 (Annualized)	8.76%

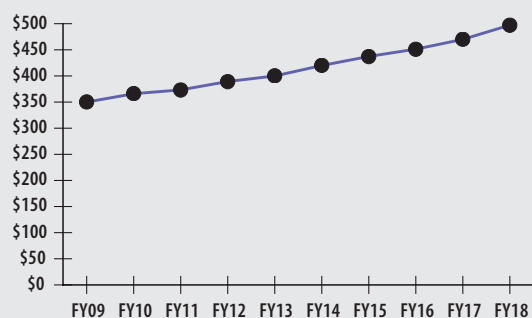
#### FUNDED RATIO (1987-2017)



#### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



#### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



#### INVESTMENT RETURN HISTORY

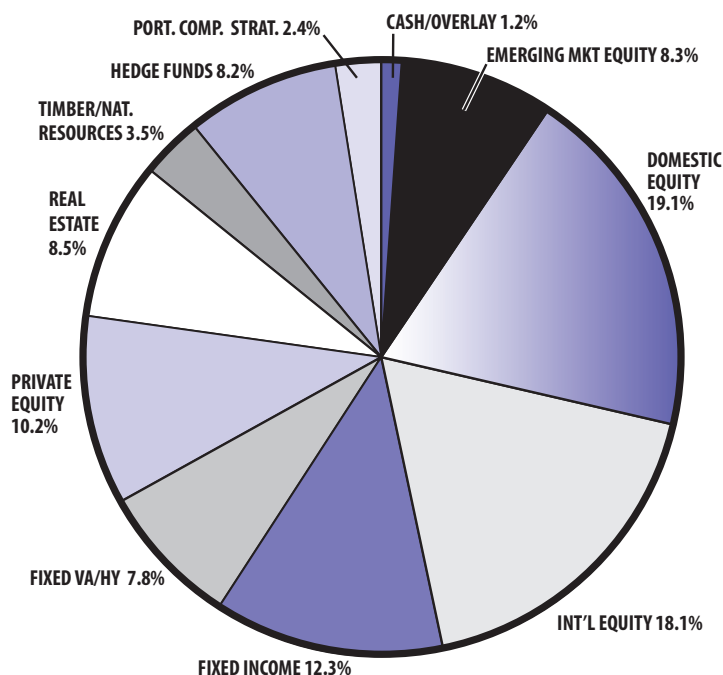
<b>33 years 2017</b> 8.85%	<b>32 years 2016</b> 8.59%	<b>31 years 2015</b> 8.61%
<b>10 years 2017</b> 5.74%	<b>10 years 2016</b> 5.22%	<b>10 years 2015</b> 5.99%
<b>5 years 2017</b> 9.87%	<b>5 years 2016</b> 9.11%	<b>5 years 2015</b> 7.55%

#### ACTUARIAL

▶ Funded Ratio	71.5%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	5.6% Total Increasing
▶ Year Fully Funded	2032
▶ Unfunded Liability	\$3.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$497,000

	ACTIVE	RETIRED
▶ Number of Members	47	55
▶ Total Payroll/Benefit	\$2.3 M	\$1.0 M
▶ Average Salary/Benefit	\$47,900	\$18,500
▶ Average Age	51	78
▶ Average Service	9.4 years	NA

#### ASSET ALLOCATION (12/31/17)



#### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	0
▶ Number Who Reported Earnings	0
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.57%
▶ 2017 Market Value	\$11.4 M
▶ 2013-2017 (Annualized)	9.87%
▶ 1985-2017 (Annualized)	8.85%



## Boston (City)

City Hall  
Room 816  
Boston, MA 02201  
Phone 617-635-4305  
Fax 617-635-4318

### Board Members

Daniel J. Greene, Esq. (Chairperson),  
Sally D. Glora, Thomas V. J. Jackson,  
Michael W. McLaughlin, Michael D. O'Reilly

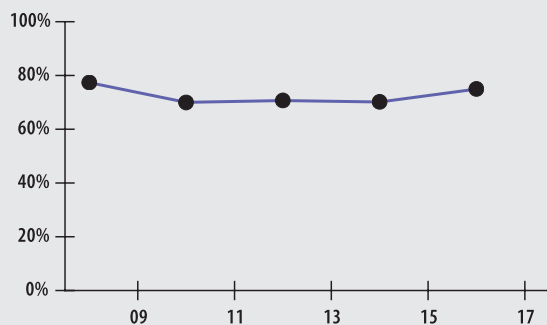
### Board Administrator

Timothy J. Smyth

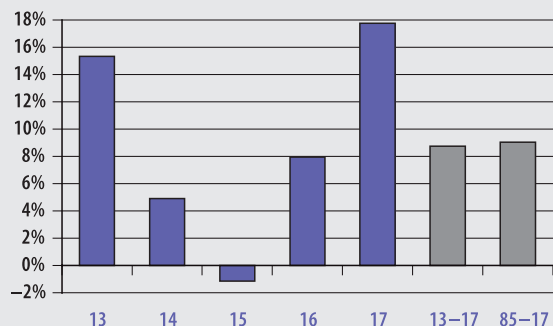
### Board Meeting

Third Wednesday of each month  
at 10:00 am

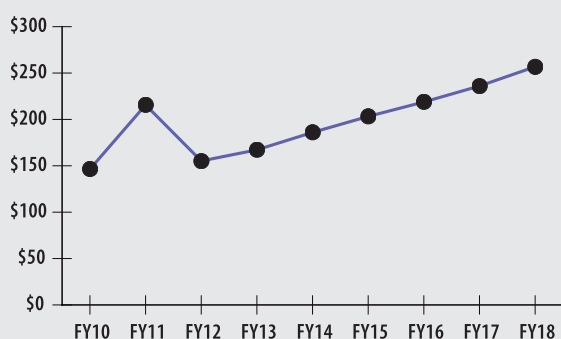
### FUNDED RATIO (2008-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 9-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
9.06%

**32 years 2016**  
8.79%

**31 years 2015**  
8.82%

**10 years 2017**  
5.97%

**10 years 2016**  
5.28%

**10 years 2015**  
5.96%

**5 years 2017**  
8.75%

**5 years 2016**  
7.86%

**5 years 2015**  
6.40%

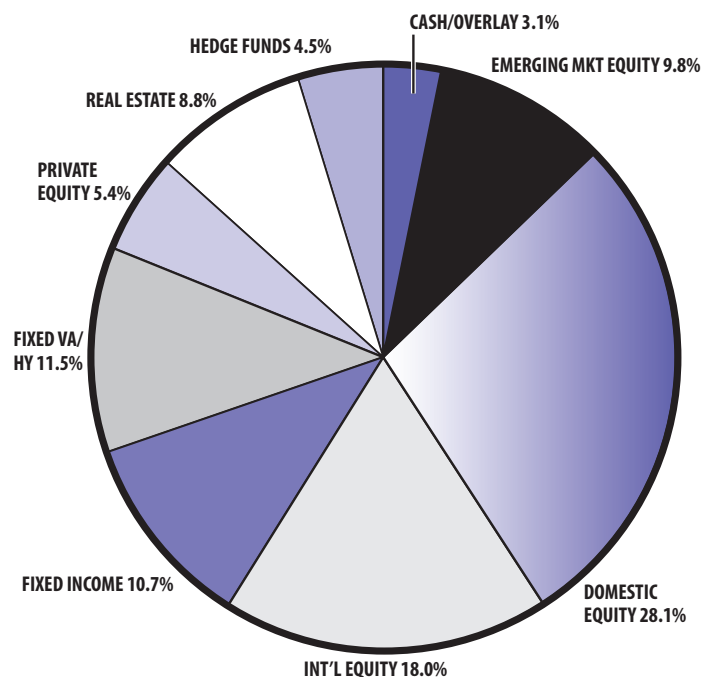
SEE NOTES - NEXT PAGE FOR BOSTON (CITY) &  
BOSTON TEACHERS

## ACTUARIAL

▶ Funded Ratio	75.0%
▶ Date of Last Valuation	01/16
▶ Actuary	Segal
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	8.85% Total Increasing
▶ Year Fully Funded	2025
▶ Unfunded Liability	\$1.48 B
▶ Total Pension Appropriation (Fiscal 2018)	\$256.6 M

	ACTIVE	RETIRED
▶ Number of Members	14,288	9,856
▶ Total Payroll/Benefit	\$909.1 M	\$321.7 M
▶ Average Salary/Benefit	\$63,600	\$32,600
▶ Average Age	47	74
▶ Average Service	14.0 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	1877
▶ Number Who Reported Earnings	261
▶ Number of Excess Earners	9
▶ Total Amount of Refund Due	\$111,807.94

▶ 2017 Return	17.76%
▶ 2017 Market Value	\$5.1 B
▶ 2013-2017 (Annualized)	8.75%
▶ 1985-2017 (Annualized)	9.06%

## Boston Teachers

City Hall  
Room 816  
Boston, MA 02201  
Phone 617-635-4305  
Fax 617-635-4318

### Board Members

Daniel J. Greene, Esq. (Chairperson),  
Sally D. Glora, Thomas V. J. Jackson,  
Michael W. McLaughlin, Michael D. O'Reilly

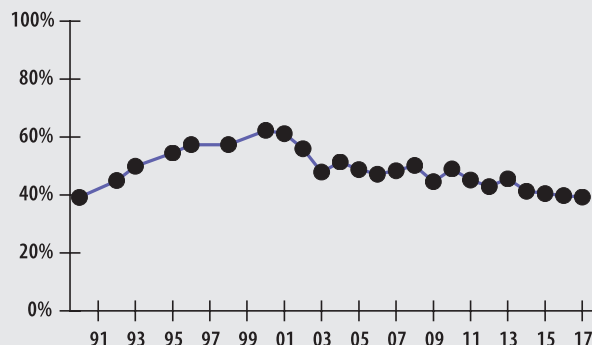
### Board Administrator

Timothy J. Smyth

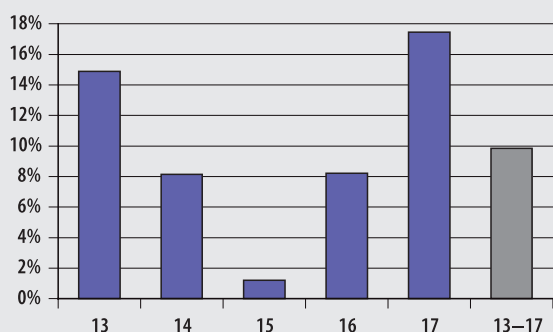
### Board Meeting

Third Wednesday of each month  
at 10:00 am

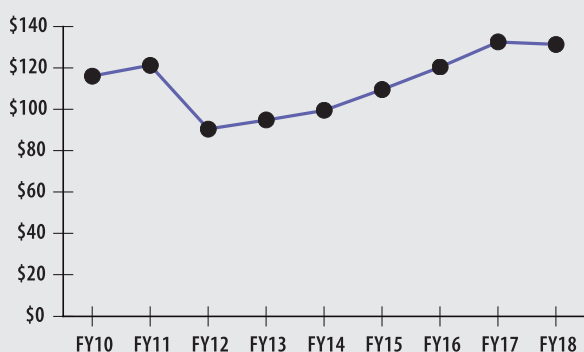
### FUNDED RATIO (1990-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AVERAGES)



### 9-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



## NOTES — BOSTON (CITY) & BOSTON TEACHERS

In this report we have separated the results for Boston Teachers and non-teachers (City). The liability for Boston Teachers has always been the responsibility of the Commonwealth. In 2010, legislation was enacted that allocated assets to Boston Teachers and separate accounts have been maintained since that date. The actuarial information for the City now solely reflects liability that is the responsibility of the City. The Funded Ratio and History of Appropriations charts for the City and the History of Appropriations chart for the Boston Teachers reflect information available since that allocation. Please note the following when reviewing the charts on these pages:

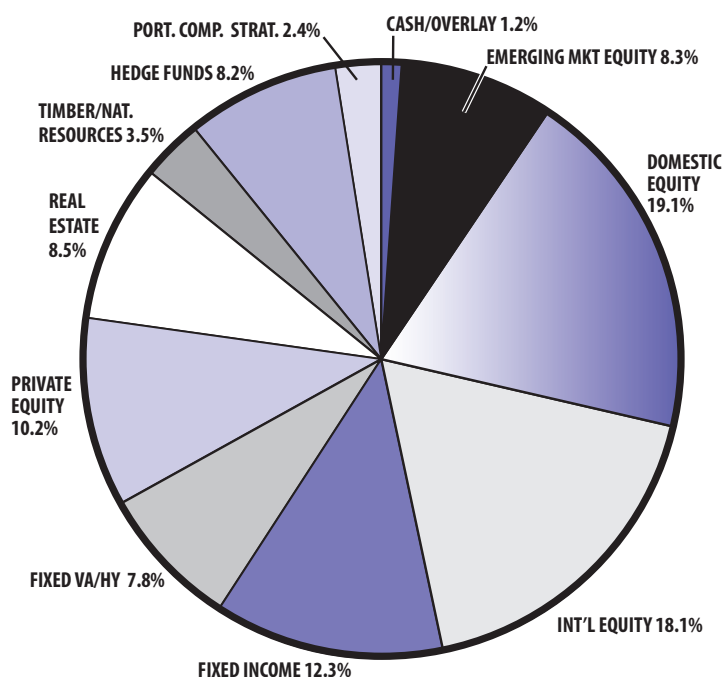
- ▶ Boston Teachers' assets prior to 2010 were estimated as approximately 30% of Boston (System) total assets.
- ▶ The information with respect to Disability Retirees on the City Board Profile page reflects the entire system, including Boston Teachers.
- ▶ The information with respect to Investment Return History for the City reflects actual returns for Boston (City) for 2013-2017 and total returns for the Boston System prior to 2011.

## ACTUARIAL

▶ Funded Ratio	39.3%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	8.94% Total Increasing
▶ Year Fully Funded	2036
▶ Unfunded Liability	\$2.38 B
▶ Total Pension Appropriation (Fiscal 2018)	\$131.3 M

	ACTIVE	RETIRED
▶ Number of Members	6,479	4,688
▶ Total Payroll/Benefit	\$548.8 M	\$239.4 M
▶ Average Salary/Benefit	\$84,700	\$51,100
▶ Average Age	42	NA
▶ Average Service	11.4 years	NA

## ASSET ALLOCATION (12/31/17)



▶ 2017 Return	17.46%
▶ 2017 Market Value	\$1.7 B
▶ 2013-2017 (Annualized)	9.84%

**Board Members**

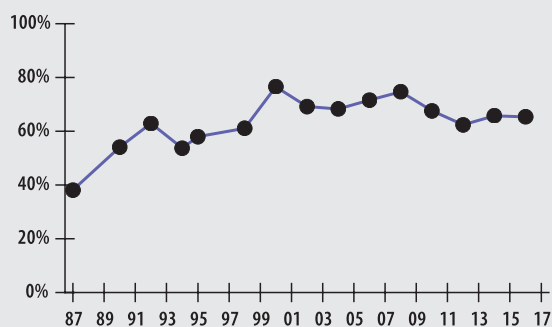
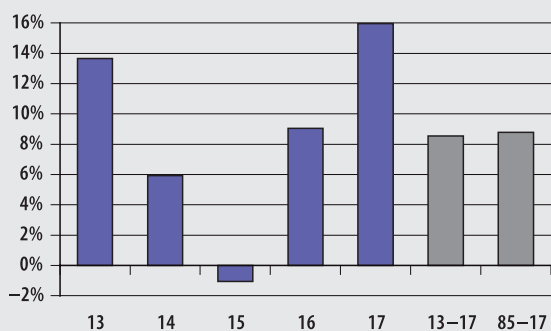
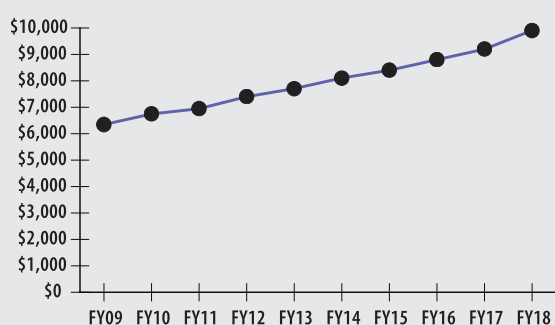
Gerald J. Kenny, Jr. (Chairperson),  
David J. DelGallo, Peter J. Morin,  
Edward J. Spellman, Jr., Frederick N. Viola

**Board Administrator**

Dennis Gallagher

**Board Meeting**

Fourth Wednesday of each month

**FUNDED RATIO (1987-2017)**

**INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)**

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**INVESTMENT RETURN HISTORY**
**33 years 2017**

8.79%

**32 years 2016**

8.57%

**31 years 2015**

8.56%

**10 years 2017**

6.12%

**10 years 2016**

5.35%

**10 years 2015**

5.81%

**5 years 2017**

8.54%

**5 years 2016**

7.89%

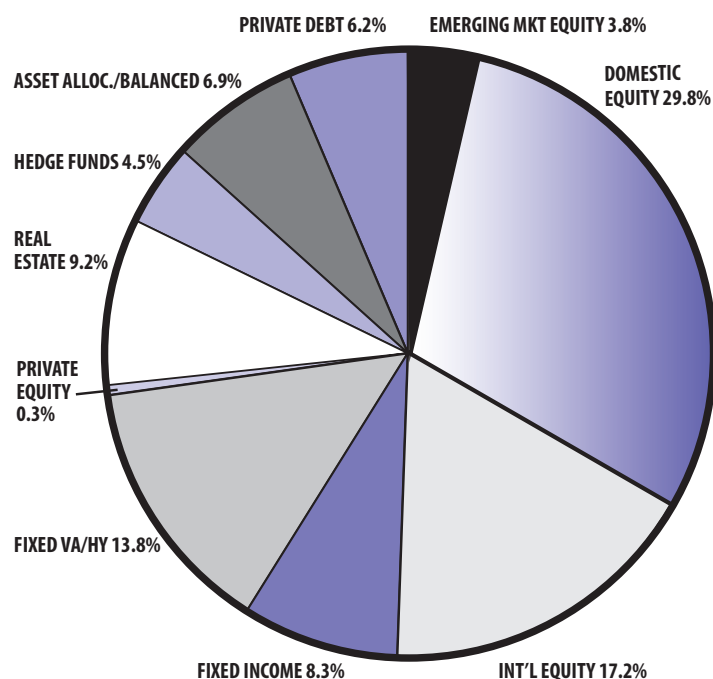
**5 years 2015**

6.26%

**ACTUARIAL**

▶ Funded Ratio	65.4%
▶ Date of Last Valuation	01/16
▶ Actuary	KMS
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.0% Increasing Phase-In
▶ Year Fully Funded	2033
▶ Unfunded Liability	\$94.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$9.9 M

	ACTIVE	RETIRED
▶ Number of Members	771	510
▶ Total Payroll/Benefit	\$45.2 M	\$15.1 M
▶ Average Salary/Benefit	\$58,600	\$29,600
▶ Average Age	49	75
▶ Average Service	13.1 years	NA

**ASSET ALLOCATION (12/31/17)**

**EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	65
▶ Number Who Reported Earnings	15
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	15.97%
▶ 2017 Market Value	\$203.8 M
▶ 2013-2017 (Annualized)	8.54%
▶ 1985-2017 (Annualized)	8.79%

## Bristol County

County Crossing  
645 County Street  
Taunton, MA 02780  
Phone 508-824-4029  
Fax 508-880-8749

### Board Members

Christopher T. Saunders, Esq. (Chairperson),  
Christine N. DeFontes, William M. Downey,  
Stephen J. Rivard, John T. Saunders

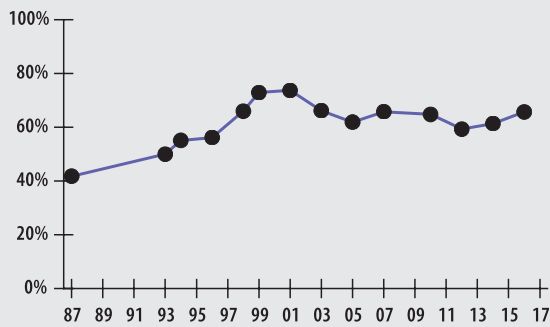
### Board Administrator

Roxanne Donovan

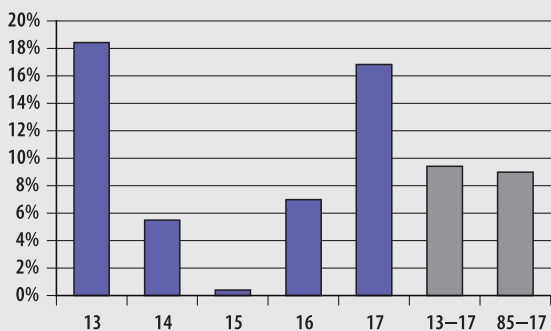
### Board Meeting

Last Thursday of each month

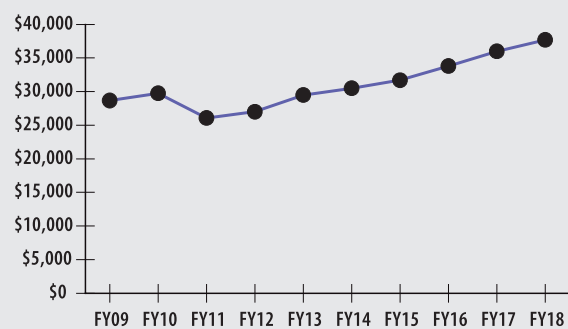
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.01%

#### 32 years 2016

8.77%

#### 31 years 2015

8.83%

#### 10 years 2017

6.28%

#### 10 years 2016

5.40%

#### 10 years 2015

6.12%

#### 5 years 2017

9.42%

#### 5 years 2016

9.22%

#### 5 years 2015

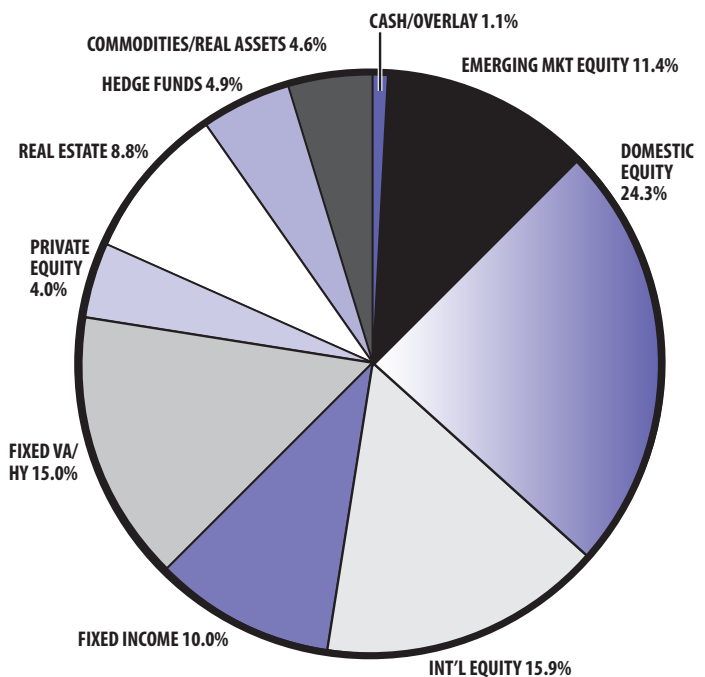
7.38%

## ACTUARIAL

▶ Funded Ratio	65.7%
▶ Date of Last Valuation	01/16
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.5% Increasing
▶ Year Fully Funded	2028
▶ Unfunded Liability	\$311.5 M
▶ Total Pension Appropriation (Fiscal 2018)	\$37.7 M

	ACTIVE	RETIRED
▶ Number of Members	3,193	2,393
▶ Total Payroll/Benefit	\$152.4 M	\$54.0 M
▶ Average Salary/Benefit	\$47,700	\$22,600
▶ Average Age	NA	72
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	255
▶ Number Who Reported Earnings	65
▶ Number of Excess Earners	1
▶ Total Amount of Refund Due	\$4,880.96

▶ 2017 Return	16.83%
▶ 2017 Market Value	\$681.7 M
▶ 2013-2017 (Annualized)	9.42%
▶ 1985-2017 (Annualized)	9.01%

## Brockton

1322 Belmont Street  
Suite 101  
Brockton, MA 02301-1813  
Phone 508-580-7847  
Fax 508-559-0559

### Board Members

William R. Farmer (Chairperson),  
Scott Albanese, Mary Lynn P. Chu,  
Edward P. Mack, Matthew J. McLaughlin

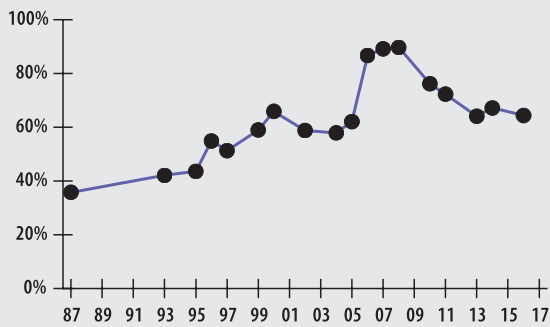
### Board Administrator

Jeanne Martineau

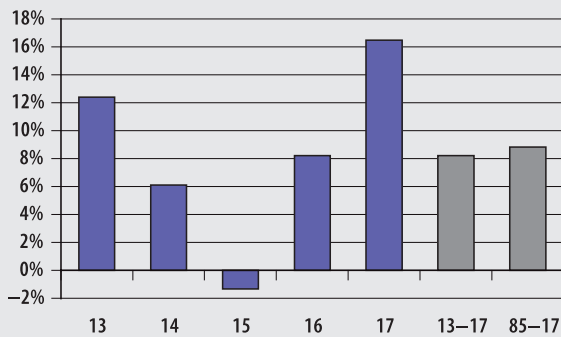
### Board Meeting

Usually a day in last week of the month

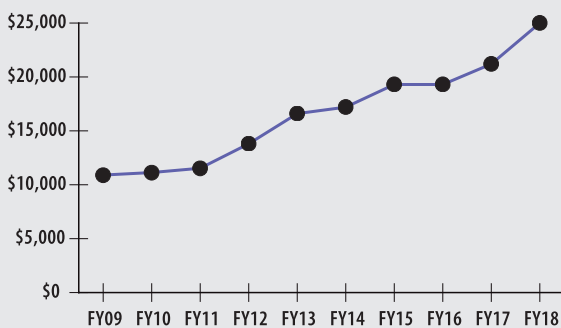
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

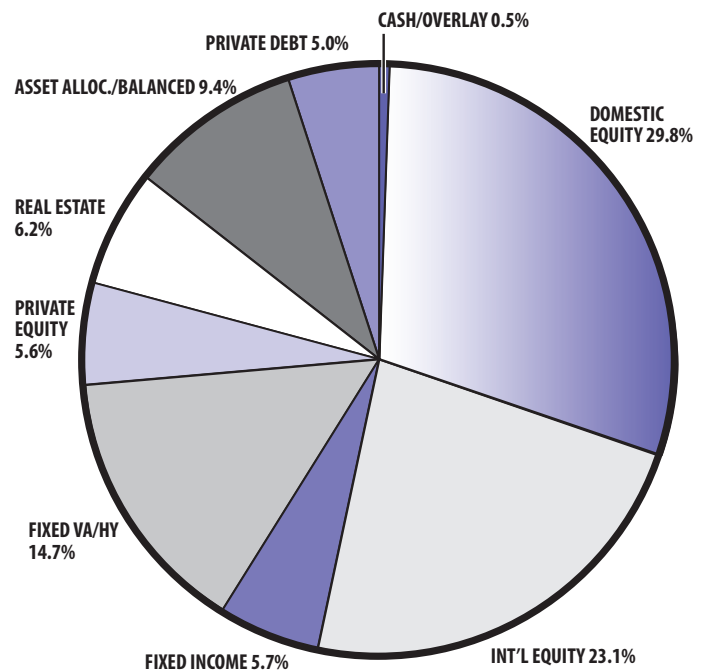
<b>33 years 2017</b> 8.83%	<b>32 years 2016</b> 8.60%	<b>31 years 2015</b> 8.61%
<b>10 years 2017</b> 5.17%	<b>10 years 2016</b> 4.28%	<b>10 years 2015</b> 4.69%
<b>5 years 2017</b> 8.22%	<b>5 years 2016</b> 7.42%	<b>5 years 2015</b> 5.76%

## ACTUARIAL

▶ Funded Ratio	64.4%
▶ Date of Last Valuation	01/16
▶ Actuary	Buck
▶ Assumed Rate of Return	8.00%
▶ Funding Schedule	4.5% Increasing
▶ Year Fully Funded	2032
▶ Unfunded Liability	\$210.6 M
▶ Total Pension Appropriation (Fiscal 2018)	\$25.0 M

	ACTIVE	RETIRED
▶ Number of Members	1,756	1,270
▶ Total Payroll/Benefit	\$89.7 M	\$38.8 M
▶ Average Salary/Benefit	\$51,100	\$30,600
▶ Average Age	47	NA
▶ Average Service	11.6 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	185
▶ Number Who Reported Earnings	33
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	16.50%
▶ 2017 Market Value	\$418.1 M
▶ 2013-2017 (Annualized)	8.22%
▶ 1985-2017 (Annualized)	8.83%

**Board Members**

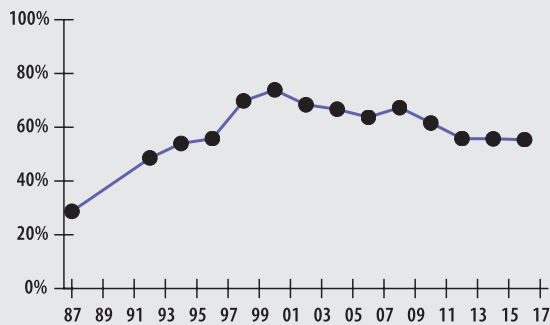
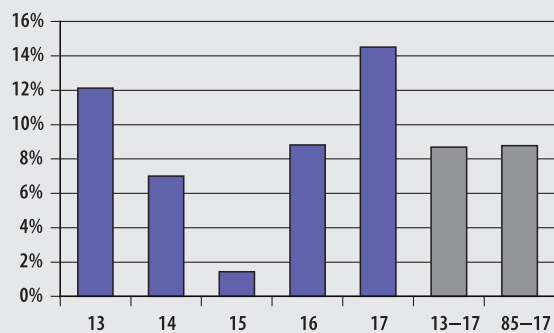
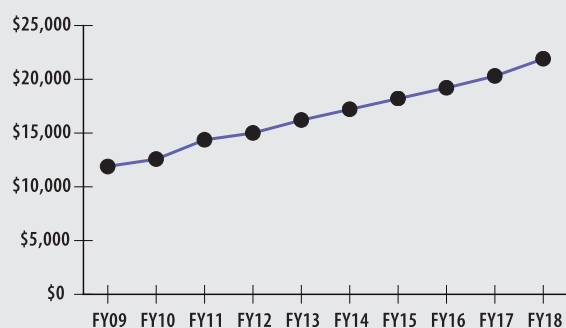
James J. Riley (Chairperson),  
Gary Altman, Michael F. DiPietro,  
Jeana A. Franconi, Robert J. Ward

**Board Administrator**

Frank J. Zecha

**Board Meeting**

Varies

**FUNDED RATIO (1987-2017)**

**INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)**

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**INVESTMENT RETURN HISTORY**

**33 years 2017**  
8.77%

**32 years 2016**  
8.60%

**31 years 2015**  
8.59%

**10 years 2017**  
5.35%

**10 years 2016**  
4.63%

**10 years 2015**  
5.13%

**5 years 2017**  
8.69%

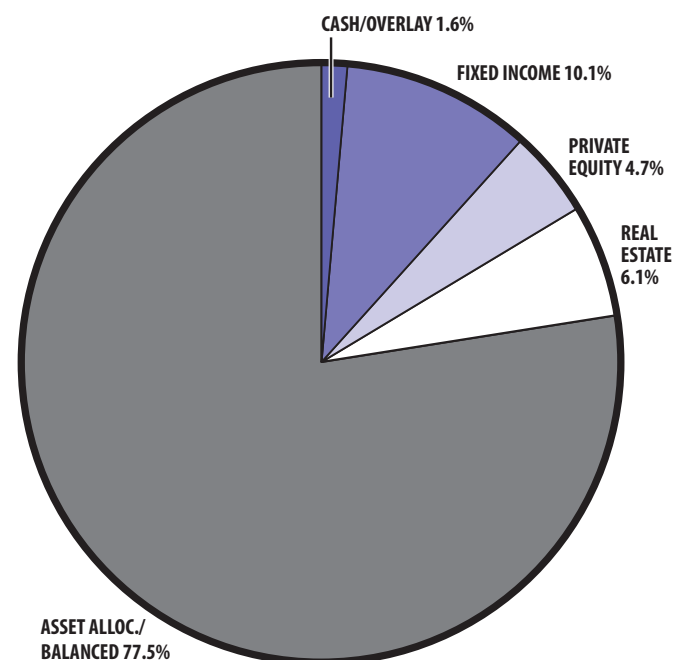
**5 years 2016**  
8.13%

**5 years 2015**  
6.02%

**ACTUARIAL**

▶ Funded Ratio	55.4%
▶ Date of Last Valuation	01/16
▶ Actuary	Segal
▶ Assumed Rate of Return	7.40%
▶ Funding Schedule	7.85% Total Increasing
▶ Year Fully Funded	2030
▶ Unfunded Liability	\$216.1 M
▶ Total Pension Appropriation (Fiscal 2018)	\$21.9 M

	ACTIVE	RETIRED
▶ Number of Members	1,318	898
▶ Total Payroll/Benefit	\$70.4 M	\$27.7 M
▶ Average Salary/Benefit	\$53,400	\$30,800
▶ Average Age	43	NA
▶ Average Service	10.5 years	NA

**ASSET ALLOCATION (12/31/17)**

**EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	186
▶ Number Who Reported Earnings	37
▶ Number of Excess Earners	1
▶ Total Amount of Refund Due	\$4,889.89

▶ 2017 Return	14.51%
▶ 2017 Market Value	\$309.0 M
▶ 2013-2017 (Annualized)	8.69%
▶ 1985-2017 (Annualized)	8.77%

**Board Members**

Francis E. Murphy III (Chairperson),  
Nadia Chamblin-Foster, Michael P. Gardner,  
James H. Monagle, John W. Shinkwin

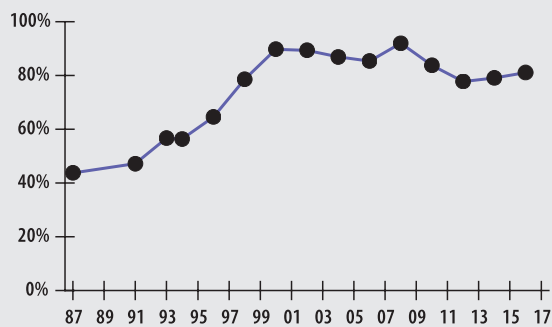
**Board Administrator**

Ellen K. Philbin

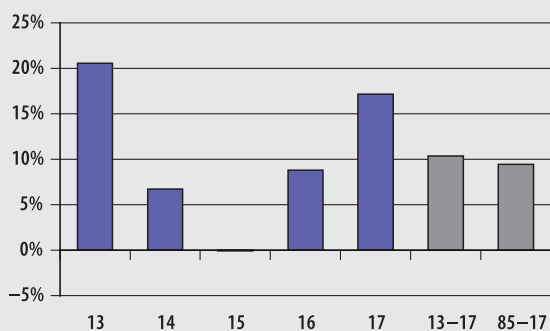
**Board Meeting**

First Monday of every month

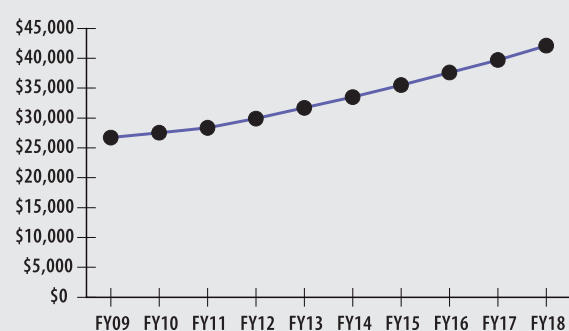
**FUNDED RATIO (1987-2017)**



**INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)**



**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**



**INVESTMENT RETURN HISTORY**

**33 years 2017**  
9.45%

**32 years 2016**  
9.22%

**31 years 2015**  
9.23%

**10 years 2017**  
6.35%

**10 years 2016**  
5.86%

**10 years 2015**  
6.28%

**5 years 2017**  
10.39%

**5 years 2016**  
9.98%

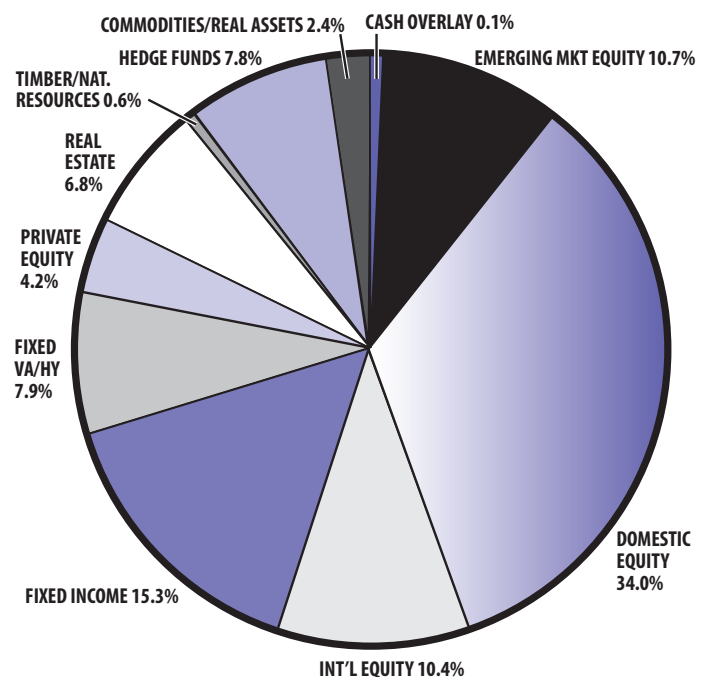
**5 years 2015**  
8.04%

**ACTUARIAL**

▶ Funded Ratio	81.1%
▶ Date of Last Valuation	01/16
▶ Actuary	Segal
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	5.85% Total Increasing
▶ Year Fully Funded	2026
▶ Unfunded Liability	\$252.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$42.1 M

	ACTIVE	RETIRED
▶ Number of Members	3,019	2,019
▶ Total Payroll/Benefit	\$221.0 M	\$67.0 M
▶ Average Salary/Benefit	\$73,200	\$33,200
▶ Average Age	48	NA
▶ Average Service	14.6 years	NA

**ASSET ALLOCATION (12/31/17)**



**EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	271
▶ Number Who Reported Earnings	44
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.17%
▶ 2017 Market Value	\$1.3 B
▶ 2013-2017 (Annualized)	10.39%
▶ 1985-2017 (Annualized)	9.45%

**Board Members**

Joseph M. Siewko (Chairperson),  
Edward M. Dunn, Cheryl Watson Fisher,  
Alice Principe, Carolyn M. Russo

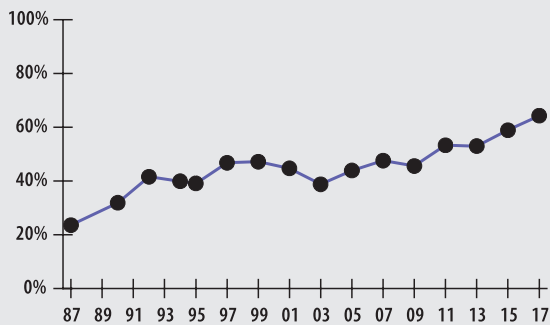
**Board Administrator**

Barbara O'Brien

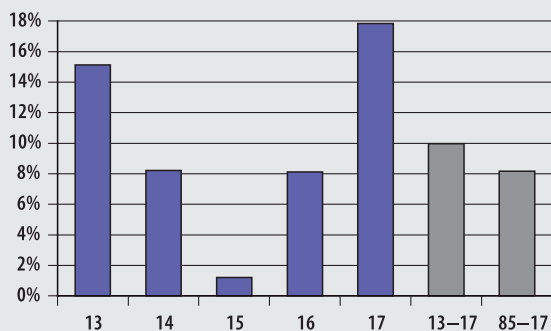
**Board Meeting**

Fourth Thursday of each month at 9:00 am

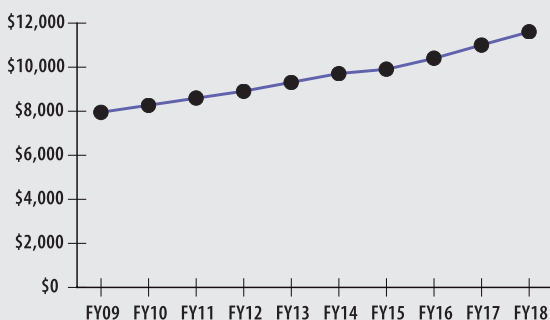
**FUNDED RATIO (1987-2017)**



**INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)**



**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**



**INVESTMENT RETURN HISTORY**

**33 years 2017**  
8.17%

**32 years 2016**  
7.88%

**31 years 2015**  
7.87%

**10 years 2017**  
5.66%

**10 years 2016**  
5.13%

**10 years 2015**  
5.95%

**5 years 2017**  
9.96%

**5 years 2016**  
9.18%

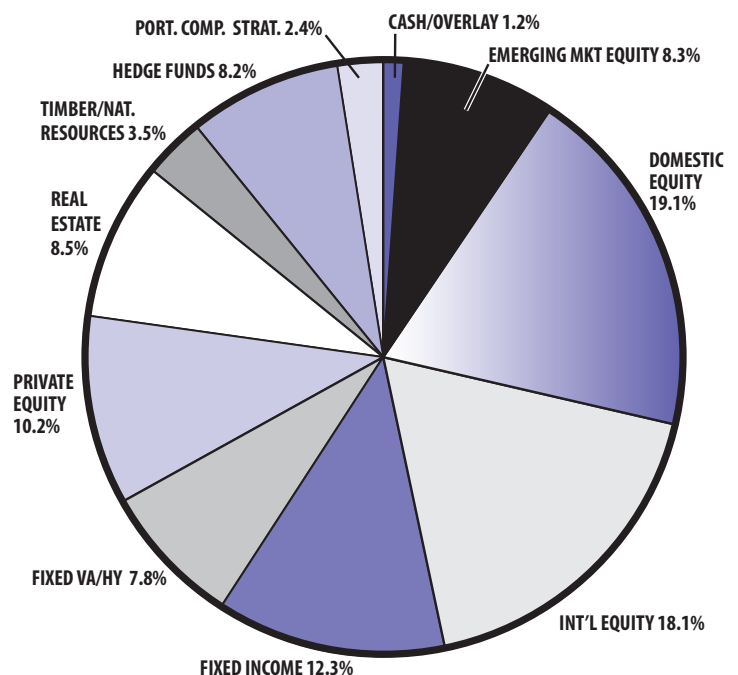
**5 years 2015**  
7.53%

**ACTUARIAL**

▶ Funded Ratio	64.3%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.35%
▶ Funding Schedule	5.7% Total Increasing
▶ Year Fully Funded	2028
▶ Unfunded Liability	\$78.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$11.6 M

	ACTIVE	RETIRED
▶ Number of Members	688	381
▶ Total Payroll/Benefit	\$35.9 M	\$10.4 M
▶ Average Salary/Benefit	\$52,200	\$27,200
▶ Average Age	46	73
▶ Average Service	12.6 years	NA

**ASSET ALLOCATION (12/31/17)**



**EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	69
▶ Number Who Reported Earnings	16
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.85%
▶ 2017 Market Value	\$166.3 M
▶ 2013-2017 (Annualized)	9.96%
▶ 1985-2017 (Annualized)	8.17%



## Chicopee

City Hall, Market Square  
274 Front Street  
Chicopee, MA 01013-2685  
Phone 413-594-1542  
Fax 413-594-1544

### Board Members

Timothy O. O'Shea, (Chairperson),  
Debra A. Boronski, David Ference,  
Paul Mailhott, Sharyn A. Riley

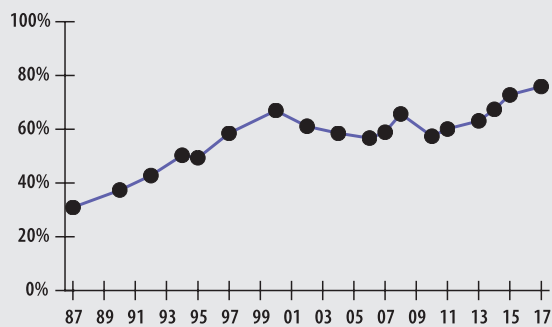
### Board Administrator

Anna Maria Hamblin

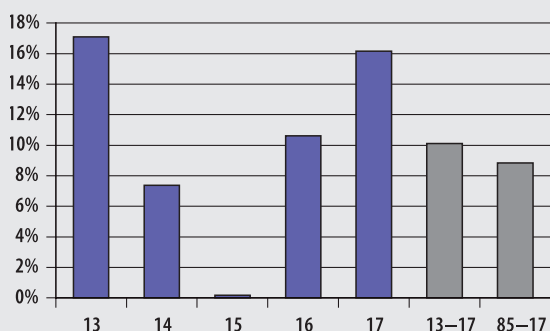
### Board Meeting

Second Thursday of each month at 2:00 pm

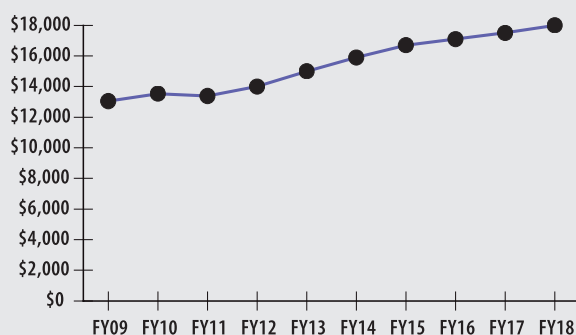
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

8.85%

#### 32 years 2016

8.63%

#### 31 years 2015

8.56%

#### 10 years 2017

7.25%

#### 10 years 2016

6.37%

#### 10 years 2015

6.44%

#### 5 years 2017

10.11%

#### 5 years 2016

10.02%

#### 5 years 2015

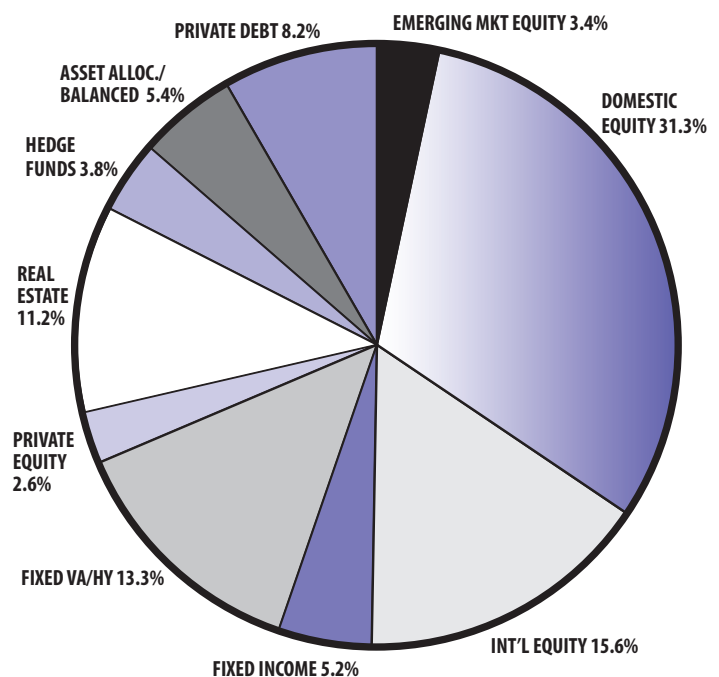
8.03%

## ACTUARIAL

▶ Funded Ratio	75.9%
▶ Date of Last Valuation	01/17
▶ Actuary	Stone
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	2.5% Total Increasing
▶ Year Fully Funded	2026
▶ Unfunded Liability	\$91.2 M
▶ Total Pension Appropriation (Fiscal 2018)	\$18.0 M

	ACTIVE	RETIRED
▶ Number of Members	1,247	797
▶ Total Payroll/Benefit	\$55.1 M	\$19.1 M
▶ Average Salary/Benefit	\$44,200	\$24,000
▶ Average Age	48	73
▶ Average Service	13.3 years	NA

## ASSET ALLOCATION (12/31/17)

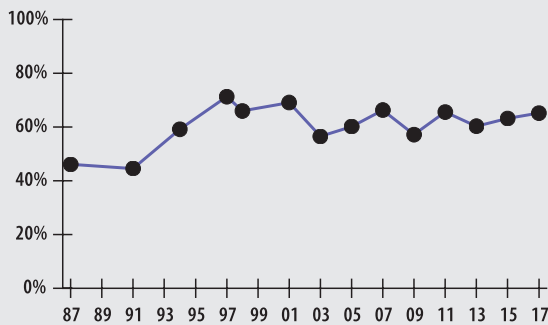


## EARNED INCOME OF DISABILITY RETIREES (2016)

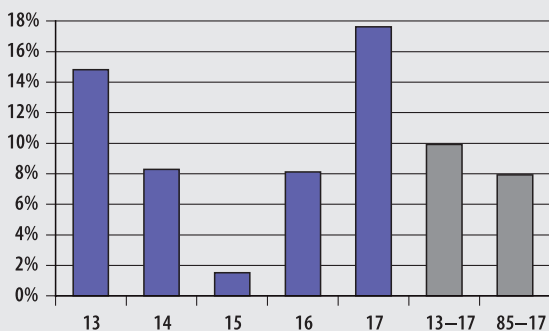
▶ Number of Disability Retirees	104
▶ Number Who Reported Earnings	21
▶ Number of Excess Earners	1
▶ Total Amount of Refund Due	\$6,677.89

▶ 2017 Return	16.16%
▶ 2017 Market Value	\$323.4 M
▶ 2013-2017 (Annualized)	10.11%
▶ 1985-2017 (Annualized)	8.85%

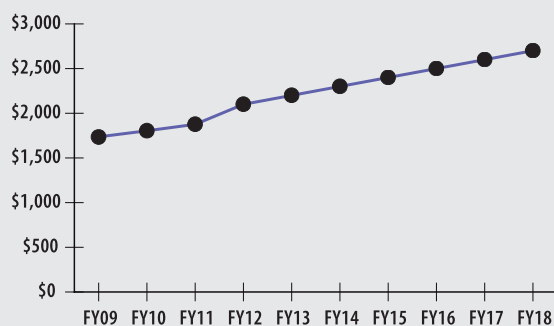
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 7.93%	<b>32 years 2016</b> 7.64%	<b>31 years 2015</b> 7.62%
<b>10 years 2017</b> 5.18%	<b>10 years 2016</b> 4.09%	<b>10 years 2015</b> 5.01%
<b>5 years 2017</b> 9.93%	<b>5 years 2016</b> 9.09%	<b>5 years 2015</b> 7.39%

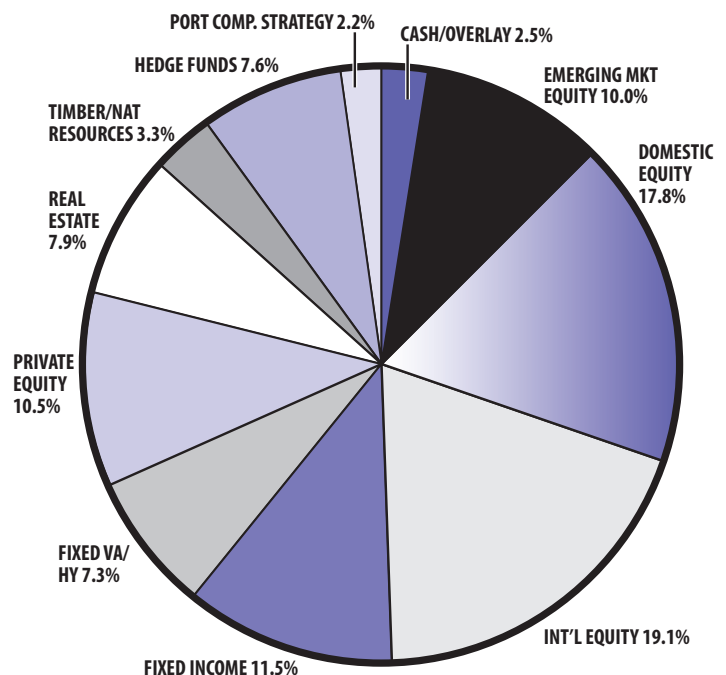
## ACTUARIAL

▶ Funded Ratio	65.2%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.40%
▶ Funding Schedule	5.0% Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$23.4 M
▶ Total Pension Appropriation (Fiscal 2018)	\$2.7 M

	ACTIVE	RETIRED
▶ Number of Members	246	130
▶ Total Payroll/Benefit	\$10.5 M	\$3.4 M
▶ Average Salary/Benefit	\$42,600	\$26,300
▶ Average Age	48	72
▶ Average Service	11.6 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	12
▶ Number Who Reported Earnings	3
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.63%
▶ 2017 Market Value	\$50.3M
▶ 2013-2017 (Annualized)	9.93%
▶ 1985-2017 (Annualized)	7.93%

## Concord

55 Church Street  
West Concord, MA 01742  
Phone 978-318-3068  
Fax 978-318-3093

### Board Members

Peter J. Fulton (Chairperson),  
Mary M. Barrett, Kerry LaFleur,  
Arnold Roth, Brian J. Whitney

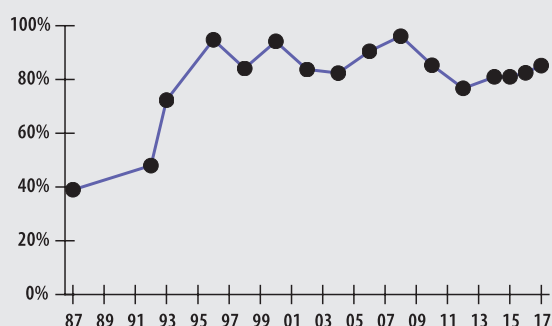
### Board Administrator

Linda Boucher

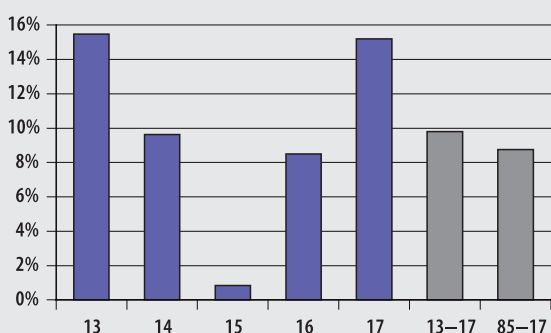
### Board Meeting

Varies, usually the last Tuesday  
of each month

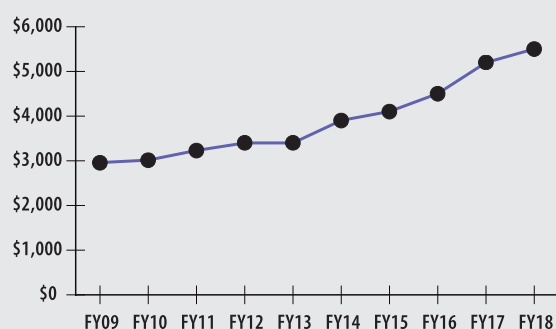
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

8.76%

#### 32 years 2016

8.56%

#### 31 years 2015

8.57%

#### 10 years 2017

6.36%

#### 10 years 2016

5.74%

#### 10 years 2015

6.23%

#### 5 years 2017

9.80%

#### 5 years 2016

9.26%

#### 5 years 2015

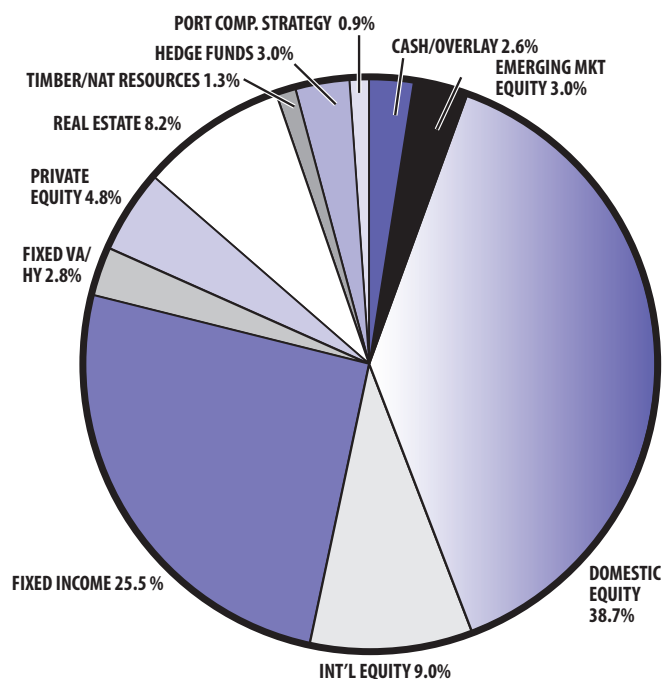
8.17%

## ACTUARIAL

▶ Funded Ratio	85.2%
▶ Date of Last Valuation	01/17
▶ Actuary	Stone
▶ Assumed Rate of Return	7.00%
▶ Funding Schedule	Level
▶ Year Fully Funded	2029
▶ Unfunded Liability	\$25.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$5.5 M

	ACTIVE	RETIRED
▶ Number of Members	535	288
▶ Total Payroll/Benefit	\$31.6 M	\$7.5 M
▶ Average Salary/Benefit	\$59,100	\$26,100
▶ Average Age	49	73
▶ Average Service	11.5 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	19
▶ Number Who Reported Earnings	7
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	15.20%
▶ 2017 Market Value	\$166.5 M
▶ 2013-2017 (Annualized)	9.80%
▶ 1985-2017 (Annualized)	8.76%

## Danvers

Town Hall  
1 Sylvan Street  
Danvers, MA 01923  
Phone 978-777-0001, Ext. 3044  
Fax 978-762-0264

### Board Members

Wayne P. Marquis (Chairperson),  
Joseph Collins, Corinna L. Grace,  
Dana M. Hagan, Stephen Swanson

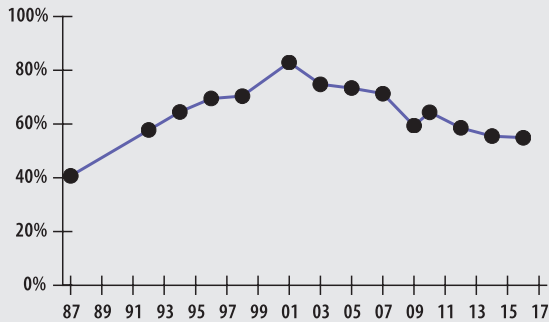
### Board Administrator

Travis Ahern

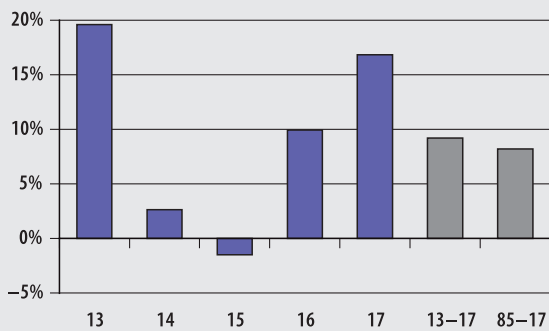
### Board Meeting

Last Wednesday of each month at 3:00 pm

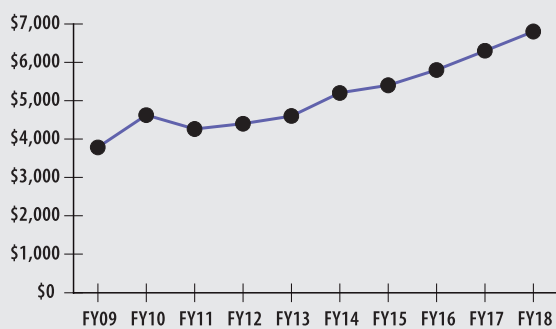
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

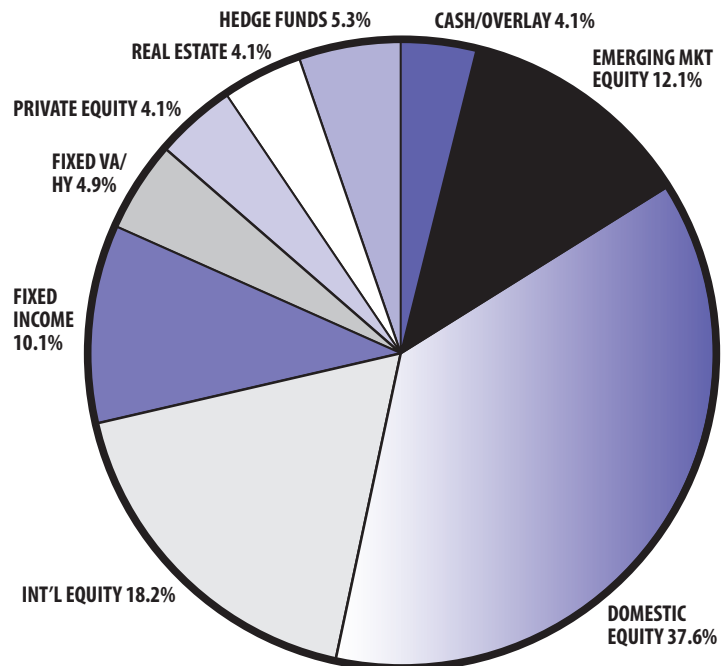
<b>33 years 2017</b> 8.21%	<b>32 years 2016</b> 7.95%	<b>31 years 2015</b> 7.89%
<b>10 years 2017</b> 5.84%	<b>10 years 2016</b> 4.79%	<b>10 years 2015</b> 4.97%
<b>5 years 2017</b> 9.22%	<b>5 years 2016</b> 8.09%	<b>5 years 2015</b> 5.29%

## ACTUARIAL

▶ Funded Ratio	54.9%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.0% Increasing Phase-In
▶ Year Fully Funded	2036
▶ Unfunded Liability	\$79.2 M
▶ Total Pension Appropriation (Fiscal 2018)	\$6.8 M

	ACTIVE	RETIRED
▶ Number of Members	467	411
▶ Total Payroll/Benefit	\$25.7 M	\$10.9 M
▶ Average Salary/Benefit	\$54,900	\$26,400
▶ Average Age	48	74
▶ Average Service	12.2 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	30
▶ Number Who Reported Earnings	6
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	16.85%
▶ 2017 Market Value	\$117.8 M
▶ 2013-2017 (Annualized)	9.22%
▶ 1985-2017 (Annualized)	8.21%

## Dedham

202 Bussey Street  
Suite 101  
Dedham, MA 02026  
Phone 781-326-7693  
Fax 781-329-4123

### Board Members

Thomas R. Rorrie (Chairperson),  
John W. Fontaine, Jr., Rachel Lopes,  
Stephen M. MacDougall, John Maloney

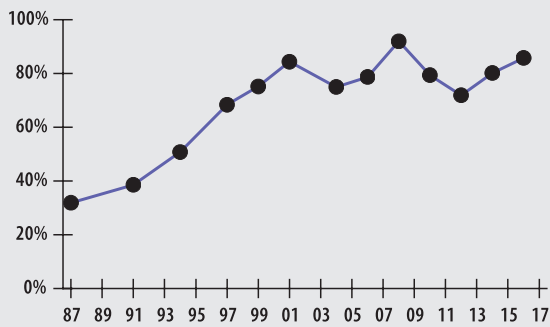
### Board Administrator

Barbara Isberg

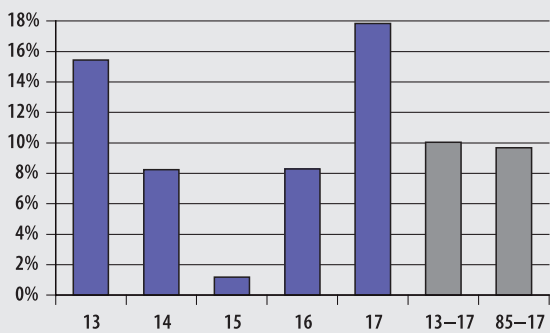
### Board Meeting

Third Wednesday of each month

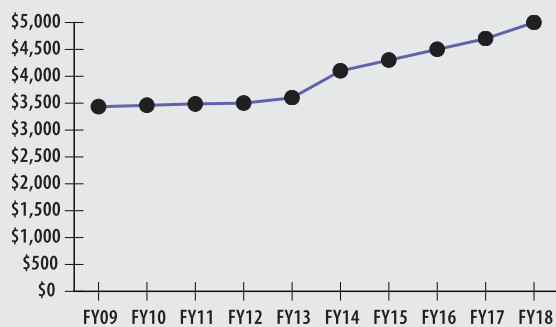
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

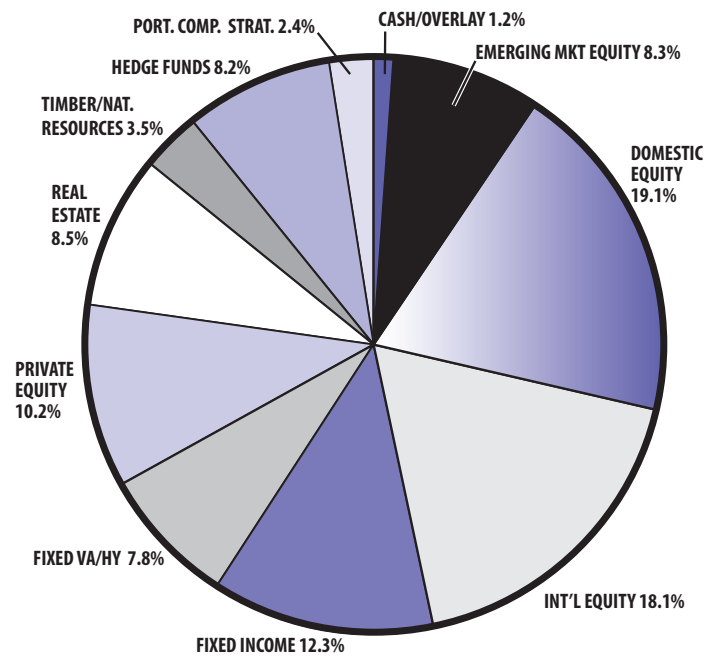
<b>33 years 2017</b> 9.68%	<b>32 years 2016</b> 9.44%	<b>31 years 2015</b> 9.47%
<b>10 years 2017</b> 5.71%	<b>10 years 2016</b> 5.19%	<b>10 years 2015</b> 5.99%
<b>5 years 2017</b> 10.04%	<b>5 years 2016</b> 9.31%	<b>5 years 2015</b> 7.62%

## ACTUARIAL

▶ Funded Ratio	85.8%
▶ Date of Last Valuation	01/16
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.5% Increasing
▶ Year Fully Funded	2022
▶ Unfunded Liability	\$18.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$5.0 M

	ACTIVE	RETIRED
▶ Number of Members	440	331
▶ Total Payroll/Benefit	\$22.5 M	\$8.9 M
▶ Average Salary/Benefit	\$51,000	\$26,900
▶ Average Age	NA	75
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)

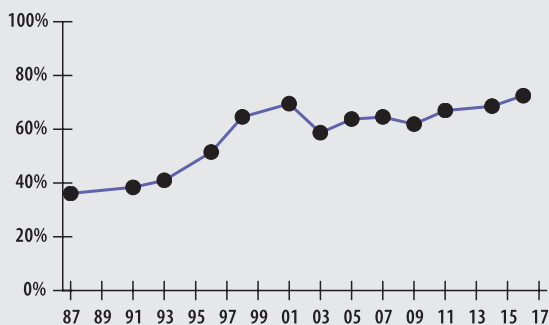


## EARNED INCOME OF DISABILITY RETIREES (2016)

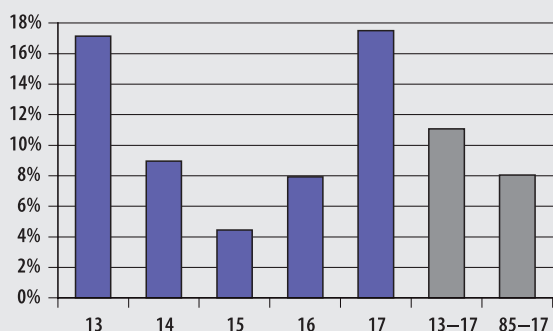
▶ Number of Disability Retirees	54
▶ Number Who Reported Earnings	8
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.84%
▶ 2017 Market Value	\$143.7 M
▶ 2013-2017 (Annualized)	10.04%
▶ 1985-2017 (Annualized)	9.68%

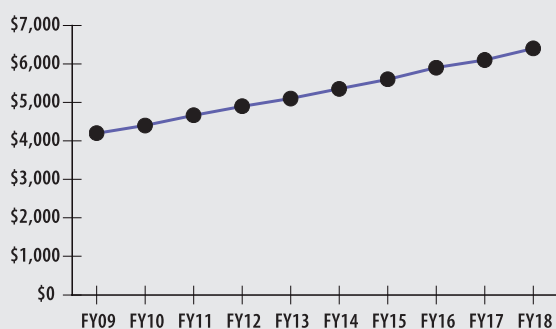
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.05%

**32 years 2016**  
7.77%

**31 years 2015**  
7.76%

**10 years 2017**  
6.95%

**10 years 2016**  
6.38%

**10 years 2015**  
7.02%

**5 years 2017**  
11.08%

**5 years 2016**  
9.97%

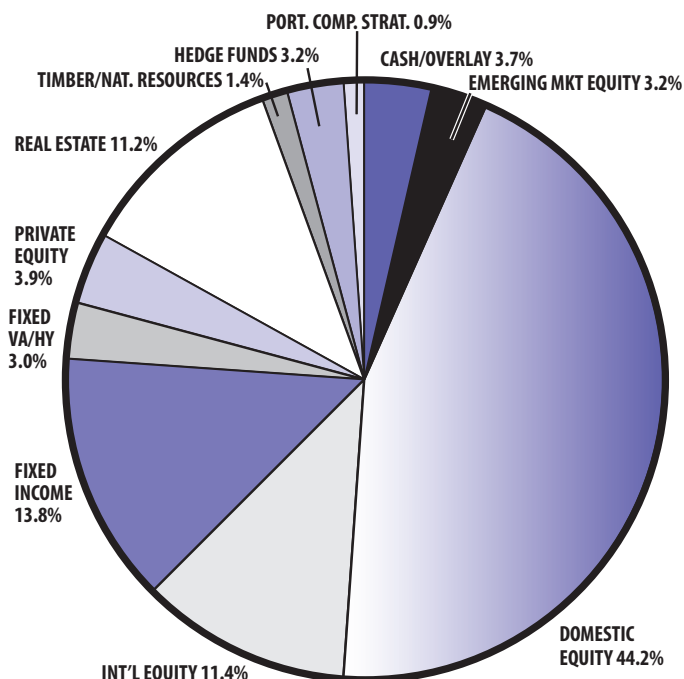
**5 years 2015**  
8.91%

### ACTUARIAL

▶ Funded Ratio	72.5%
▶ Date of Last Valuation	01/16
▶ Actuary	KMS
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2030
▶ Unfunded Liability	\$46.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$6.4 M

	ACTIVE	RETIRED
▶ Number of Members	672	292
▶ Total Payroll/Benefit	\$38.0 M	\$6.9 M
▶ Average Salary/Benefit	\$56,500	\$23,600
▶ Average Age	49	70
▶ Average Service	10.8 years	NA

### ASSET ALLOCATION (12/31/17)



### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	27
▶ Number Who Reported Earnings	10
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.50%
▶ 2017 Market Value	\$155.3 M
▶ 2013-2017 (Annualized)	11.08%
▶ 1985-2017 (Annualized)	8.05%

## Board Members

James P. Dunham (Chairperson),  
Valerie J. Bernier, Donald C. Emerson,  
Jane Sakiewicz, Cornelius E. Sullivan

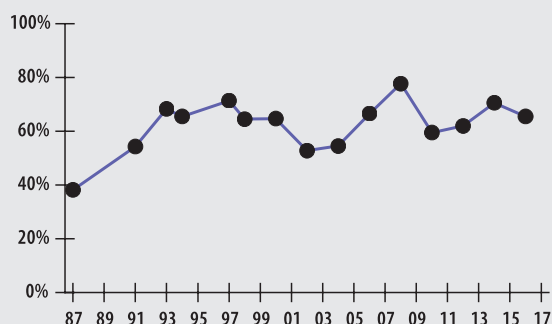
## Board Administrator

Kymme Wood

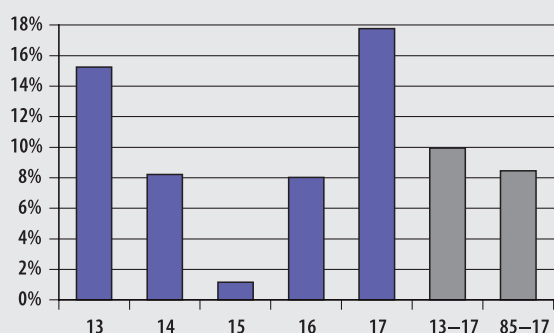
## Board Meeting

Fourth Tuesday of each month

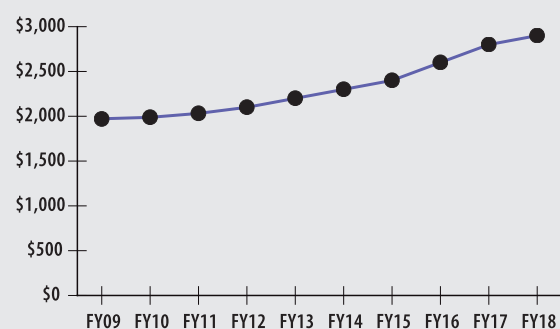
## FUNDED RATIO (1987-2017)



## INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



## 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



## INVESTMENT RETURN HISTORY

### 33 years 2017

8.47%

### 32 years 2016

8.19%

### 31 years 2015

8.19%

### 10 years 2017

5.62%

### 10 years 2016

5.09%

### 10 years 2015

5.92%

### 5 years 2017

9.94%

### 5 years 2016

9.19%

### 5 years 2015

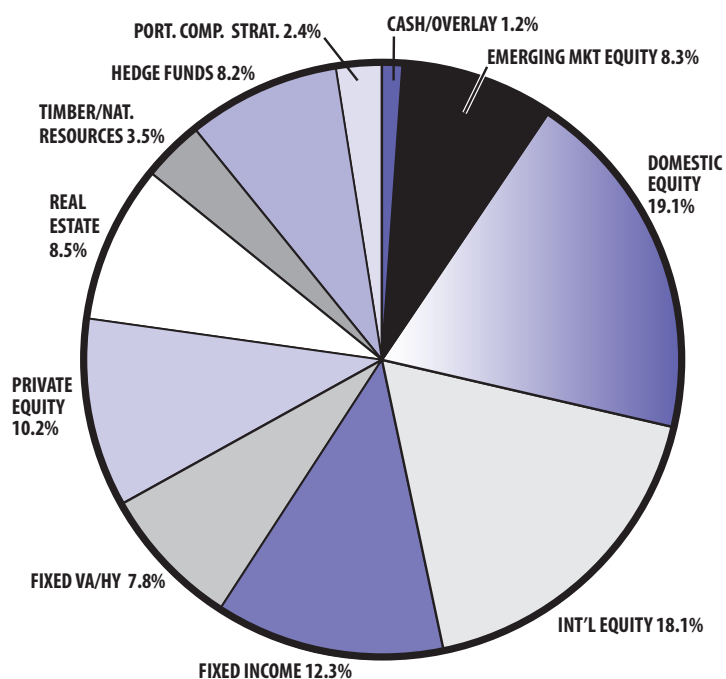
7.56%

## ACTUARIAL

▶ Funded Ratio	65.5%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	5.0% Total Increasing
▶ Year Fully Funded	2033
▶ Unfunded Liability	\$22.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$2.9 M

	ACTIVE	RETIRED
▶ Number of Members	216	161
▶ Total Payroll/Benefit	\$9.6 M	\$3.4 M
▶ Average Salary/Benefit	\$44,400	\$21,200
▶ Average Age	48	71
▶ Average Service	13.1 years	NA

## ASSET ALLOCATION (12/31/17)

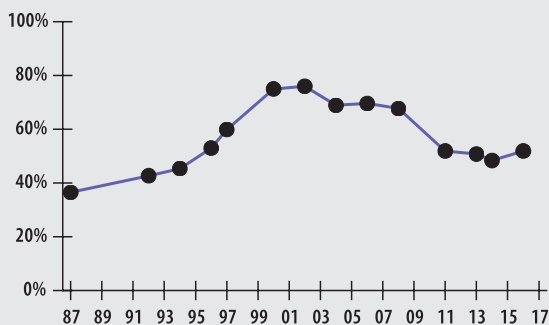


## EARNED INCOME OF DISABILITY RETIREES (2016)

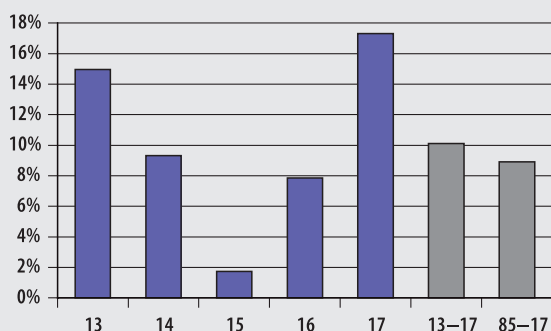
▶ Number of Disability Retirees	20
▶ Number Who Reported Earnings	3
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.78%
▶ 2017 Market Value	\$54.0 M
▶ 2013-2017 (Annualized)	9.94%
▶ 1985-2017 (Annualized)	8.47%

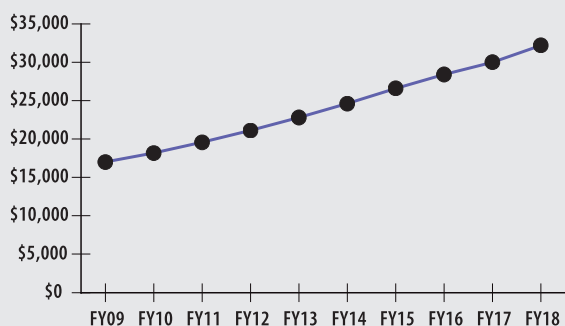
#### FUNDED RATIO (1987-2017)



#### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



#### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



#### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.92%

**32 years 2016**  
8.67%

**31 years 2015**  
8.70%

**10 years 2017**  
5.69%

**10 years 2016**  
5.00%

**10 years 2015**  
5.75%

**5 years 2017**  
10.11%

**5 years 2016**  
9.37%

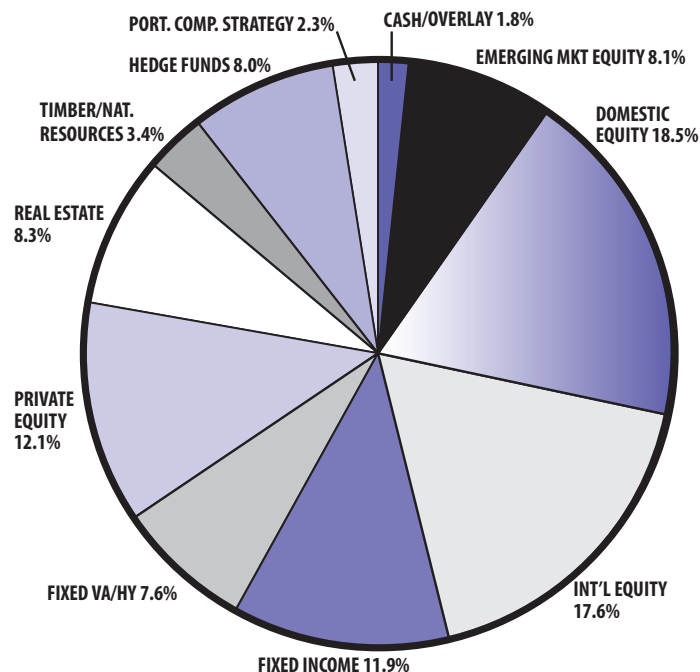
**5 years 2015**  
7.84%

#### ACTUARIAL

▶ Funded Ratio	51.9%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$358.8 M
▶ Total Pension Appropriation (Fiscal 2018)	\$32.2 M

	ACTIVE	RETIRED
▶ Number of Members	2,738	1,768
▶ Total Payroll/Benefit	\$126.9 M	\$39.2 M
▶ Average Salary/Benefit	\$46,400	\$22,200
▶ Average Age	49	73
▶ Average Service	11.0 years	NA

#### ASSET ALLOCATION (12/31/17)



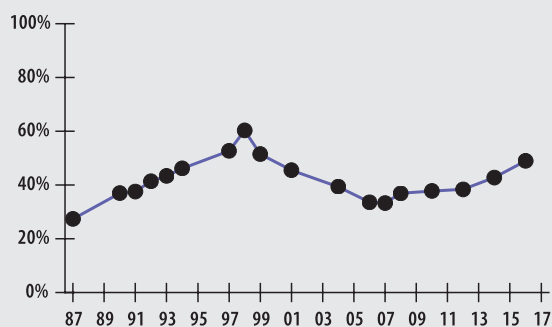
#### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	127
▶ Number Who Reported Earnings	32
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

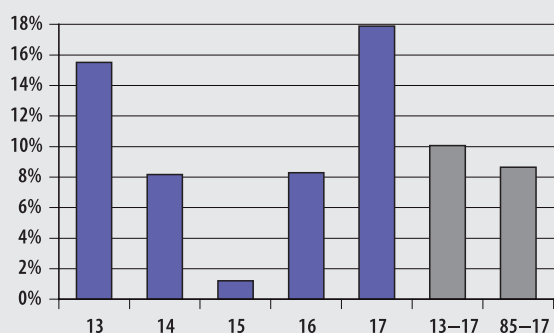
▶ 2017 Return	17.31%
▶ 2017 Market Value	\$463.3 M
▶ 2013-2017 (Annualized)	10.11%
▶ 1985-2017 (Annualized)	8.92%



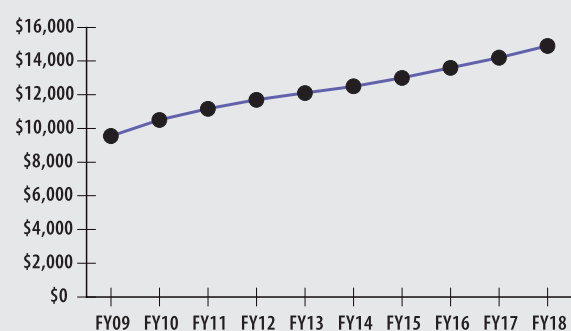
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 8.65%	<b>32 years 2016</b> 8.37%	<b>31 years 2015</b> 8.37%
<b>10 years 2017</b> 5.73%	<b>10 years 2016</b> 5.18%	<b>10 years 2015</b> 5.96%
<b>5 years 2017</b> 10.06%	<b>5 years 2016</b> 9.32%	<b>5 years 2015</b> 7.63%

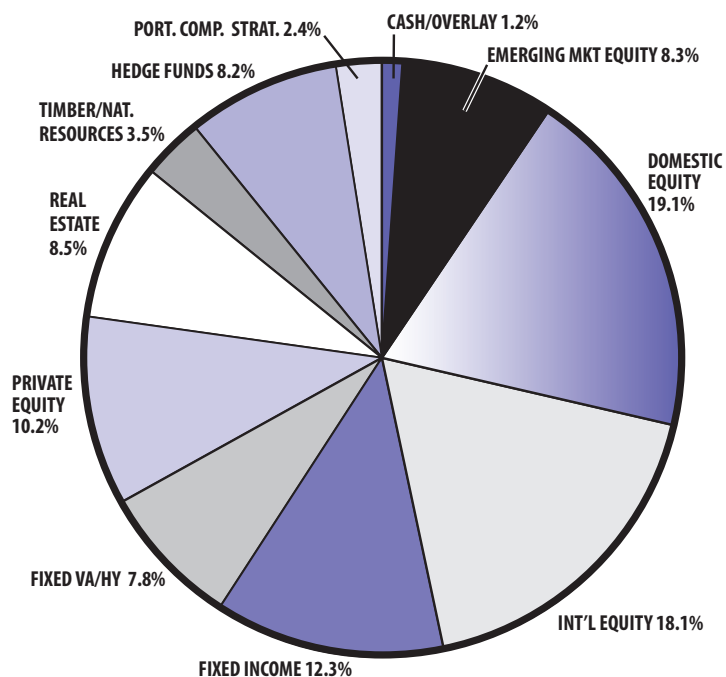
### ACTUARIAL

▶ Funded Ratio	49.0%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.63%
▶ Funding Schedule	5.01% Total Increasing
▶ Year Fully Funded	2029
▶ Unfunded Liability	\$117.3 M
▶ Total Pension Appropriation (Fiscal 2018)	\$14.9 M

	ACTIVE	RETIRED
▶ Number of Members	737	527
▶ Total Payroll/Benefit	\$40.0 M	\$12.6 M
▶ Average Salary/Benefit	\$54,200	\$23,800
▶ Average Age	46	76
▶ Average Service	10.7 years	NA

### ASSET ALLOCATION (12/31/17)

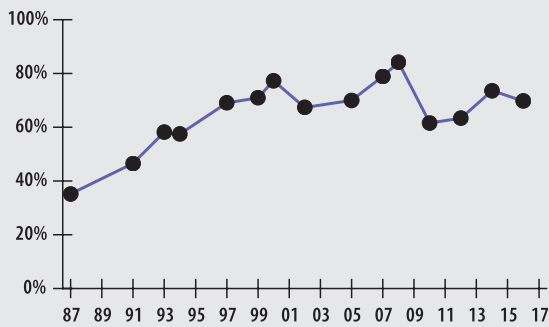


### EARNED INCOME OF DISABILITY RETIREES (2016)

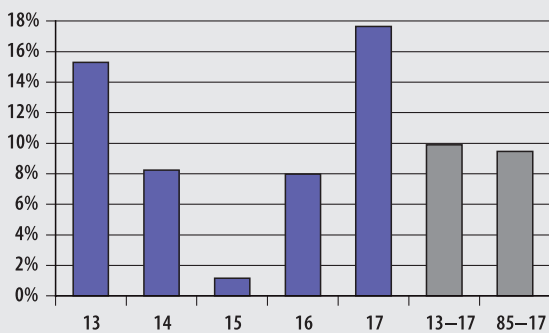
▶ Number of Disability Retirees	73
▶ Number Who Reported Earnings	15
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.90%
▶ 2017 Market Value	\$151.4 M
▶ 2013-2017 (Annualized)	10.06%
▶ 1985-2017 (Annualized)	8.65%

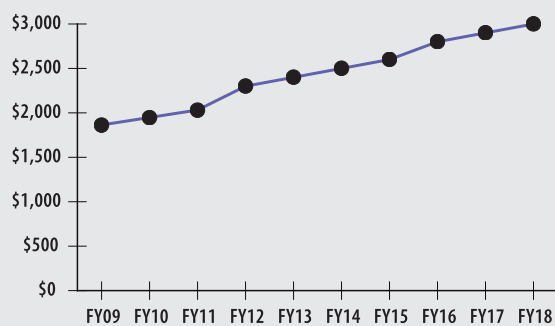
## FUNDED RATIO (1987-2017)



## INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



## 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



## INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 9.46%	<b>32 years 2016</b> 9.22%	<b>31 years 2015</b> 9.26%
<b>10 years 2017</b> 5.61%	<b>10 years 2016</b> 5.08%	<b>10 years 2015</b> 5.90%
<b>5 years 2017</b> 9.91%	<b>5 years 2016</b> 9.20%	<b>5 years 2015</b> 7.59%

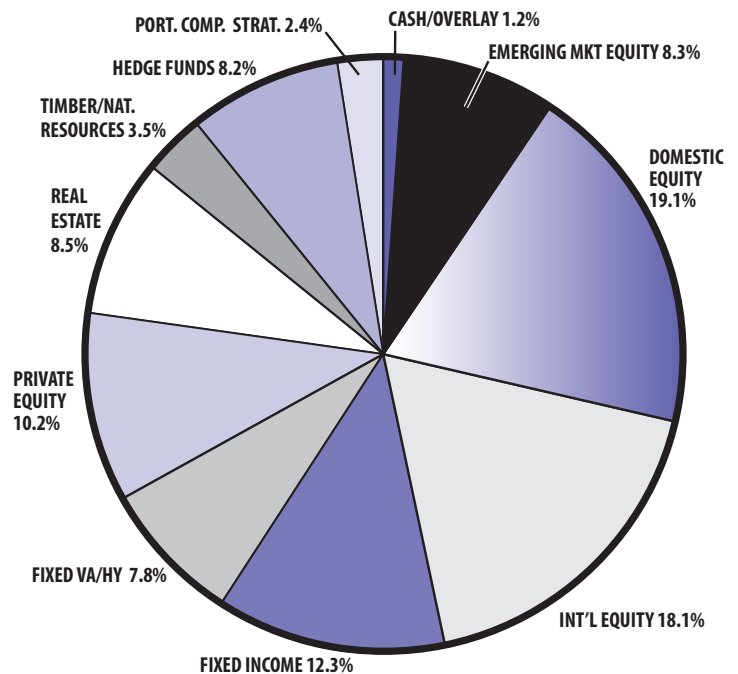
## ACTUARIAL

▶ Funded Ratio	69.8%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	5.0% Total Increasing
▶ Year Fully Funded	2031
▶ Unfunded Liability	\$22.1 M
▶ Total Pension Appropriation (Fiscal 2018)	\$3.0 M

	ACTIVE	RETIRED
▶ Number of Members	255	181
▶ Total Payroll/Benefit	\$11.1 M	\$3.8 M
▶ Average Salary/Benefit	\$43,600	\$20,900
▶ Average Age	48	73
▶ Average Service	13.1 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	21
▶ Number Who Reported Earnings	10
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.64%
▶ 2017 Market Value	\$63.2 M
▶ 2013-2017 (Annualized)	9.91%
▶ 1985-2017 (Annualized)	9.46%

## Fall River

30 Third Street  
Suite 301  
Fall River, MA 02720  
Phone 508-646-9120  
Fax 508-646-9123

### Board Members

Arthur Viana (Chairperson),  
Jennifer Argo, Robert Camara,  
David Machado, Mark Nassiff, Jr.

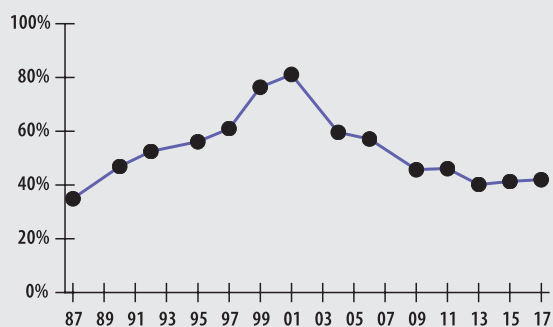
### Board Administrator

Christine Tetreault

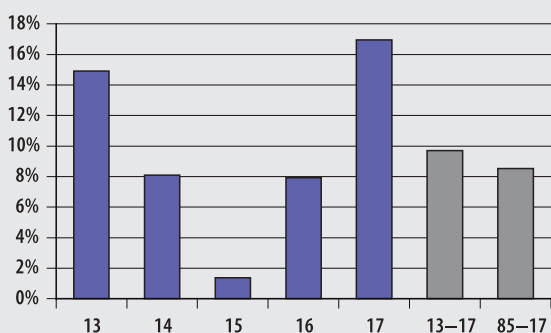
### Board Meeting

Varies

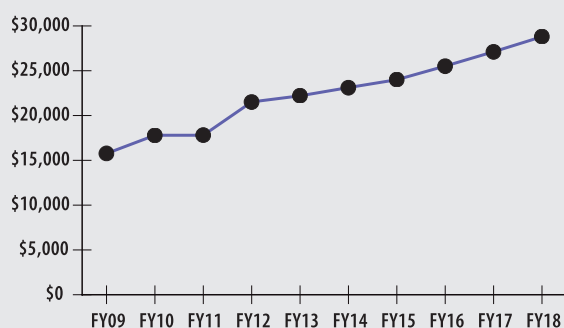
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.54%

**32 years 2016**  
8.29%

**31 years 2015**  
8.30%

**10 years 2017**  
5.70%

**10 years 2016**  
4.80%

**10 years 2015**  
5.26%

**5 years 2017**  
9.71%

**5 years 2016**  
9.10%

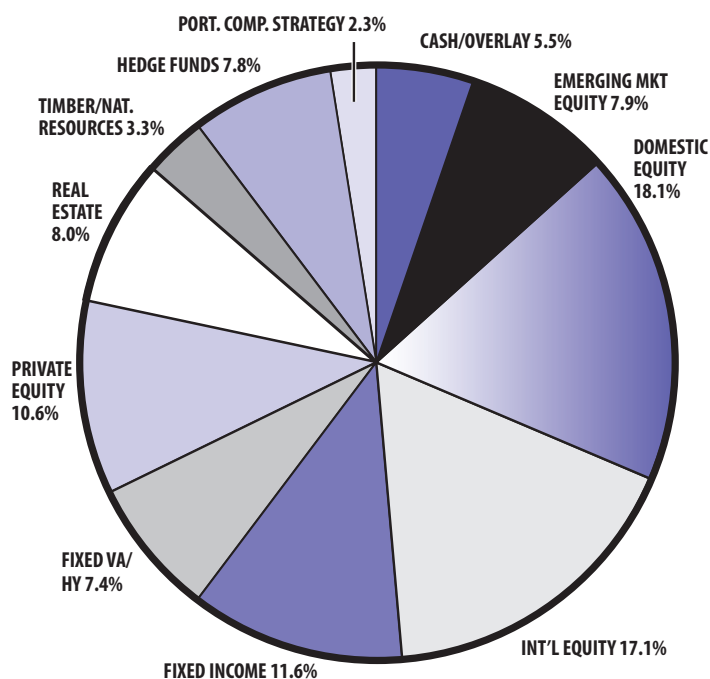
**5 years 2015**  
7.56%

## ACTUARIAL

▶ Funded Ratio	42.0%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	6.5% Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$355.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$28.8 M

	ACTIVE	RETIRED
▶ Number of Members	1,498	1,557
▶ Total Payroll/Benefit	\$72.4 M	\$38.2 M
▶ Average Salary/Benefit	\$48,400	\$24,500
▶ Average Age	47	73
▶ Average Service	13.2 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	249
▶ Number Who Reported Earnings	54
▶ Number of Excess Earners	4
▶ Total Amount of Refund Due	\$36,066.83

▶ 2017 Return	16.95%
▶ 2017 Market Value	\$273.1 M
▶ 2013-2017 (Annualized)	9.71%
▶ 1985-2017 (Annualized)	8.54%

## Falmouth

80 Davis Straits, Suite 102  
Falmouth, MA 02540  
Phone 508-457-0578  
Fax 508-540-9962

### Board Members

Russell R. Ferreira (Chairperson),  
Craig O'Malley, Jennifer P. Petit,  
Ellen K. Philbin

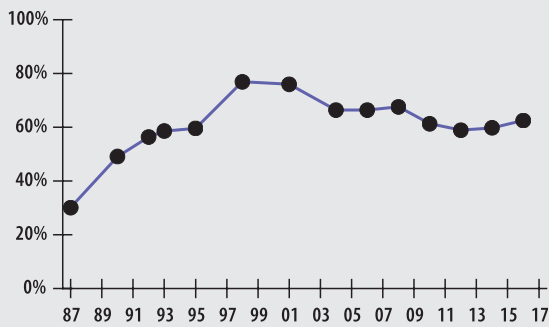
### Board Administrator

Francis X. St. Germaine III

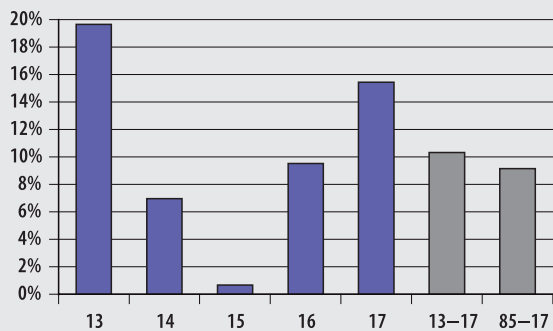
### Board Meeting

Varies

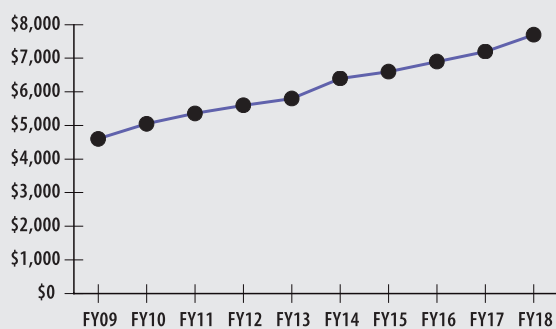
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.16%

#### 32 years 2016

8.97%

#### 31 years 2015

8.94%

#### 10 years 2017

6.31%

#### 10 years 2016

5.51%

#### 10 years 2015

5.90%

#### 5 years 2017

10.33%

#### 5 years 2016

9.93%

#### 5 years 2015

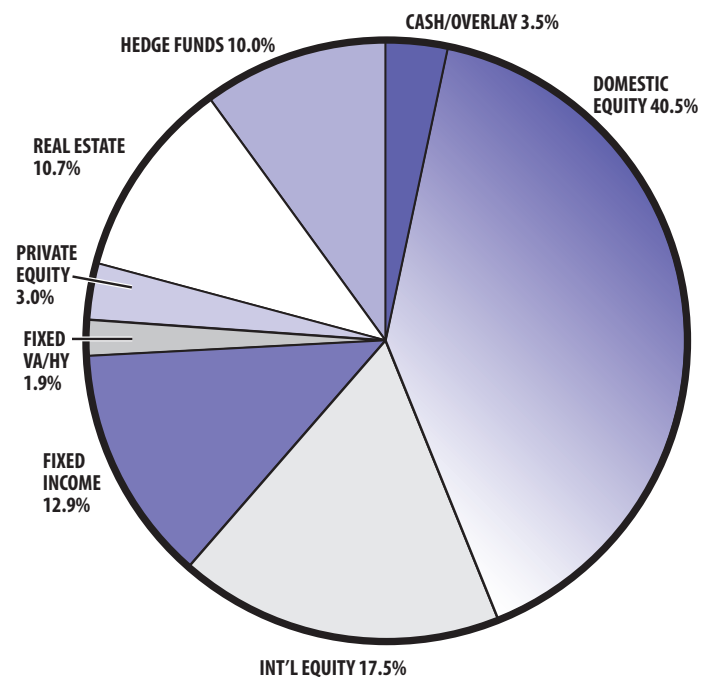
8.15%

## ACTUARIAL

▶ Funded Ratio	62.5%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	5.86% Total Increasing
▶ Year Fully Funded	2033
▶ Unfunded Liability	\$71.5 M
▶ Total Pension Appropriation (Fiscal 2018)	\$7.7 M

	ACTIVE	RETIRED
▶ Number of Members	571	379
▶ Total Payroll/Benefit	\$28.4 M	\$10.2 M
▶ Average Salary/Benefit	\$49,800	\$27,000
▶ Average Age	49	72
▶ Average Service	12.6 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	41
▶ Number Who Reported Earnings	16
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	15.46%
▶ 2017 Market Value	\$144.7 M
▶ 2013-2017 (Annualized)	10.33%
▶ 1985-2017 (Annualized)	9.16%

**Board Members**

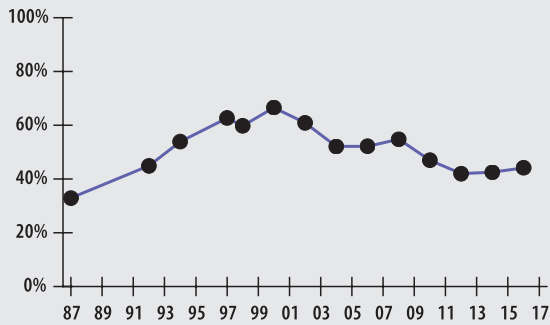
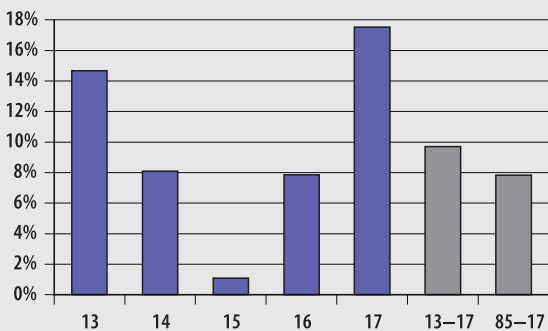
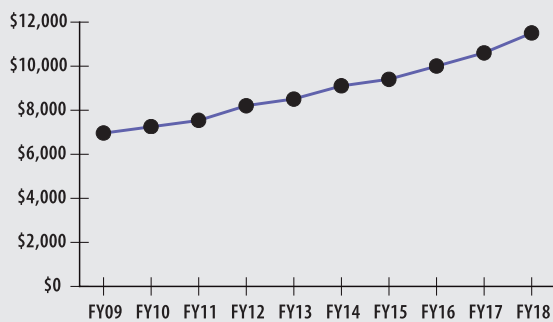
Norman J. LeBlanc (Chairperson),  
Calvin Brooks, John C. Curran,  
Thomas A. Dateo, Jr., Ellen M. Jerszyk

**Board Administrator**

Tina Schneider

**Board Meeting**

Fourth Tuesday of each month at 10:00 am

**FUNDED RATIO (1987-2017)**

**INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)**

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**INVESTMENT RETURN HISTORY**

**33 years 2017**  
7.84%

**32 years 2016**  
7.55%

**31 years 2015**  
7.54%

**10 years 2017**  
5.39%

**10 years 2016**  
4.68%

**10 years 2015**  
5.11%

**5 years 2017**  
9.70%

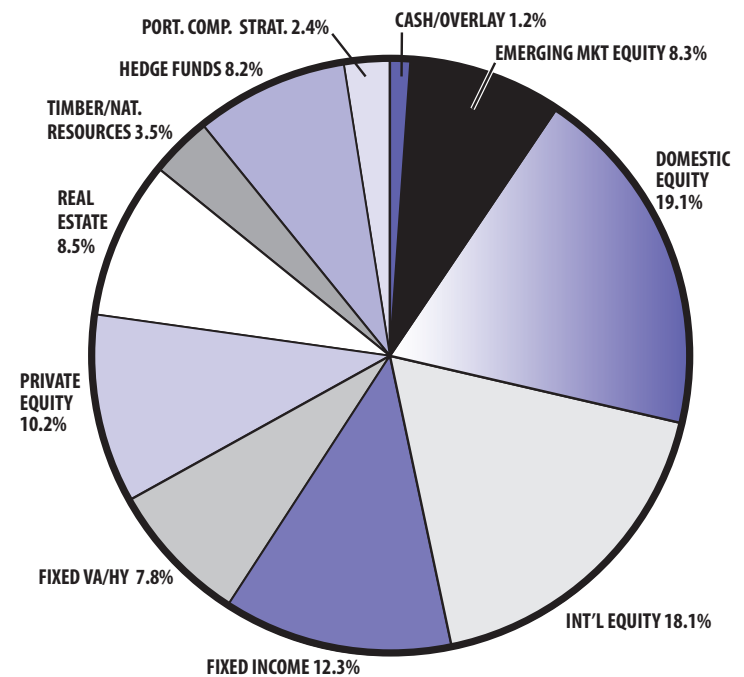
**5 years 2016**  
8.90%

**5 years 2015**  
7.33%

**ACTUARIAL**

▶ Funded Ratio	44.2%
▶ Date of Last Valuation	1/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2032
▶ Unfunded Liability	\$131.4 M
▶ Total Pension Appropriation (Fiscal 2018)	\$11.5 M

	ACTIVE	RETIRED
▶ Number of Members	648	568
▶ Total Payroll/Benefit	\$30.7 M	\$14.3 M
▶ Average Salary/Benefit	\$47,300	\$25,100
▶ Average Age	47	73
▶ Average Service	12.0 years	NA

**ASSET ALLOCATION (12/31/17)**

**EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	61
▶ Number Who Reported Earnings	9
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.54%
▶ 2017 Market Value	\$120.6 M
▶ 2013-2017 (Annualized)	9.70%
▶ 1985-2017 (Annualized)	7.84%

## Framingham

Memorial Building  
150 Concord Street, Room B-31  
Framingham, MA 01702-8325  
Phone 508-532-5465  
Fax 508-532-5757

### Board Members

Richard C. Howarth, Jr. (Chairperson),  
Joseph Fonseca, Mary Ellen Kelley,  
Peter J. Rovinelli, John W. White, Jr.

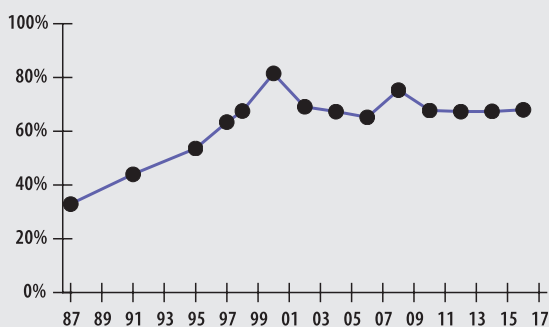
### Board Administrator

Laurie A. Lizak

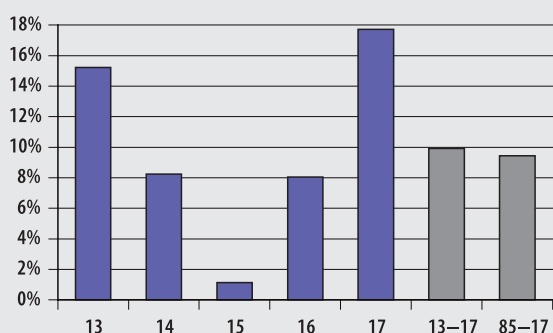
### Board Meeting

Varies

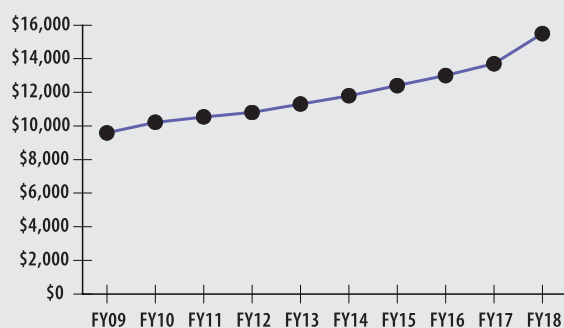
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.44%

#### 32 years 2016

9.19%

#### 31 years 2015

9.23%

#### 10 years 2017

5.62%

#### 10 years 2016

5.10%

#### 10 years 2015

5.92%

#### 5 years 2017

9.92%

#### 5 years 2016

9.20%

#### 5 years 2015

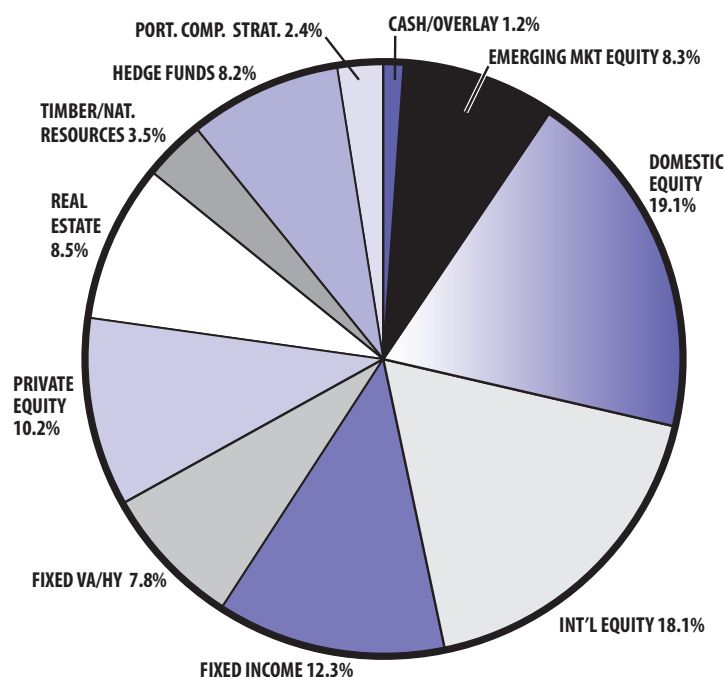
7.56%

## ACTUARIAL

▶ Funded Ratio	68.0%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	5.85% Total Increasing
▶ Year Fully Funded	2030
▶ Unfunded Liability	\$123.4 M
▶ Total Pension Appropriation (Fiscal 2018)	\$15.5 M

	ACTIVE	RETIRED
▶ Number of Members	1,191	808
▶ Total Payroll/Benefit	\$64.1 M	\$21.3 M
▶ Average Salary/Benefit	\$53,800	\$26,300
▶ Average Age	47	74
▶ Average Service	11.7 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	74
▶ Number Who Reported Earnings	15
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.73%
▶ 2017 Market Value	\$317.8 M
▶ 2013-2017 (Annualized)	9.92%
▶ 1985-2017 (Annualized)	9.44%

**Board Members**

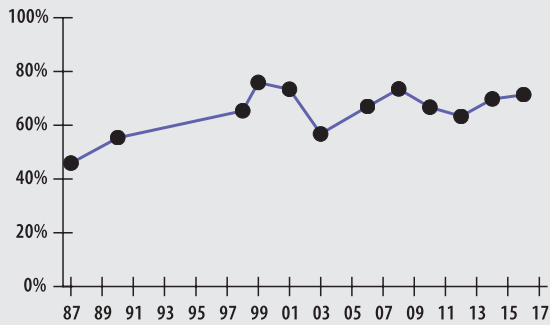
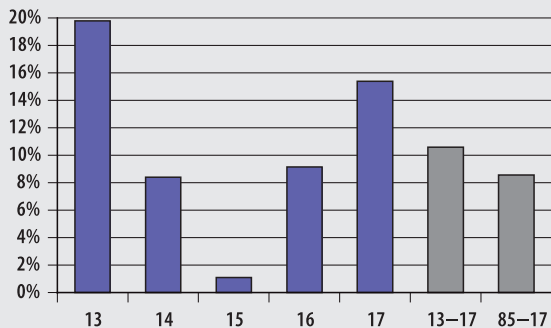
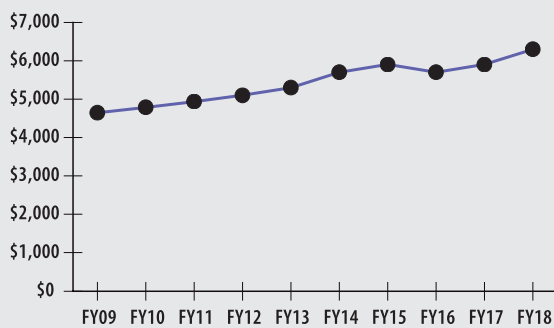
Sandra A. Hanks (Chairperson),  
Paula Light, Paul Mokrzecki,  
Mary A. Stokarski, Gabrielle H. Voelker

**Board Administrator**

Dale Kowacki

**Board Meeting**

Usually meets the last Wednesday  
of each month

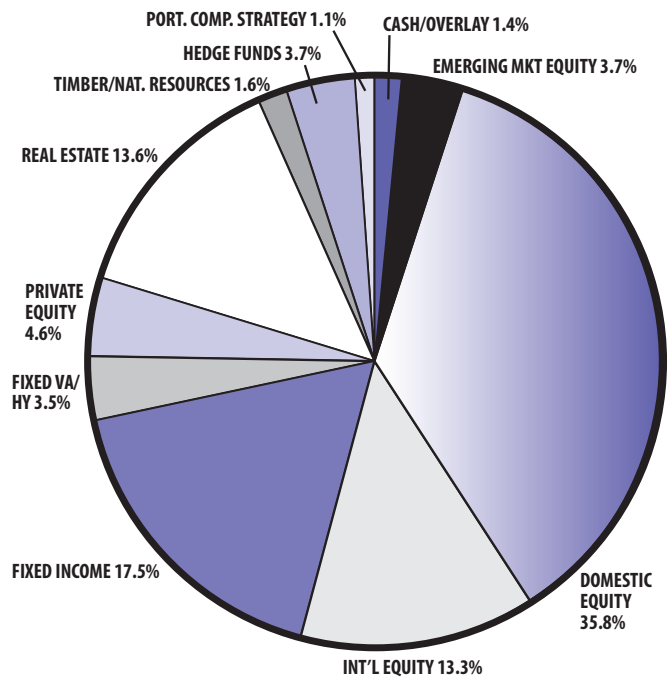
**FUNDED RATIO (1987-2017)**

**INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)**

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**INVESTMENT RETURN HISTORY**

<b>33 years 2017</b> 8.57%	<b>32 years 2016</b> 8.36%	<b>31 years 2015</b> 8.34%
<b>10 years 2017</b> 6.57%	<b>10 years 2016</b> 6.17%	<b>10 years 2015</b> 6.57%
<b>5 years 2017</b> 10.59%	<b>5 years 2016</b> 10.20%	<b>5 years 2015</b> 8.49%

**ACTUARIAL**

▶ Funded Ratio	71.4%
▶ Date of Last Valuation	01/16
▶ Actuary	KMS
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.0% Increasing Phase-In
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$48.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$6.3 M

	ACTIVE	RETIRED
▶ Number of Members	933	550
▶ Total Payroll/Benefit	\$33.6 M	\$8.6 M
▶ Average Salary/Benefit	\$36,000	\$15,600
▶ Average Age	48	72
▶ Average Service	10.5 years	NA

**ASSET ALLOCATION (12/31/17)**

**EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	25
▶ Number Who Reported Earnings	5
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	15.41%
▶ 2017 Market Value	\$145.8 M
▶ 2013-2017 (Annualized)	10.59%
▶ 1985-2017 (Annualized)	8.57%

## Gardner

City Hall, Room 17  
95 Pleasant Street  
Gardner, MA 01440  
Phone 978-630-4006  
Fax 978-630-4012

### Board Members

Denise M. Merriam (Chairperson),  
Neil W. Janssens, Kevin McNerney,  
Robert W. Newton, John Richard

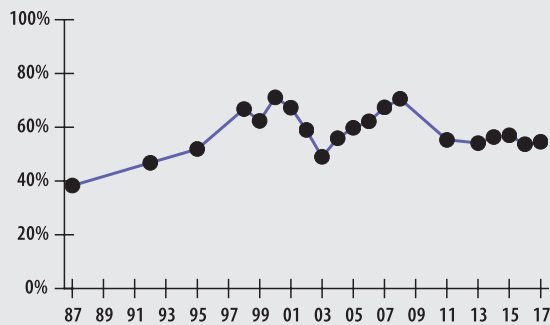
### Board Administrator

Cheryl Bosse

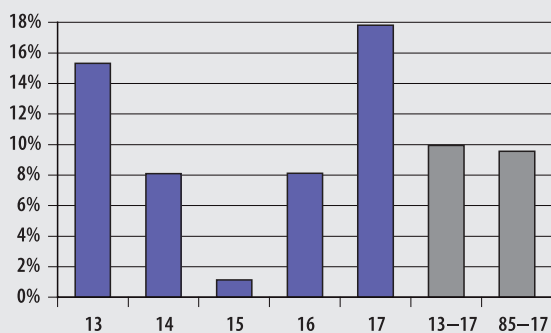
### Board Meeting

Varies

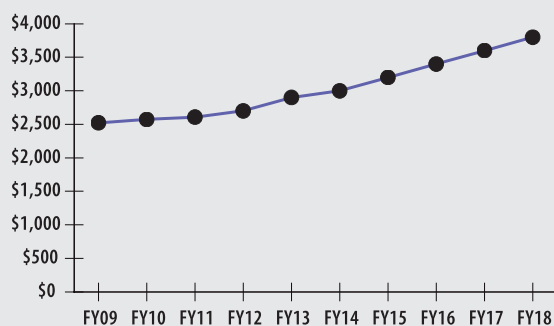
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
9.56%

**32 years 2016**  
9.31%

**31 years 2015**  
9.35%

**10 years 2017**  
5.60%

**10 years 2016**  
5.07%

**10 years 2015**  
5.87%

**5 years 2017**  
9.94%

**5 years 2016**  
9.21%

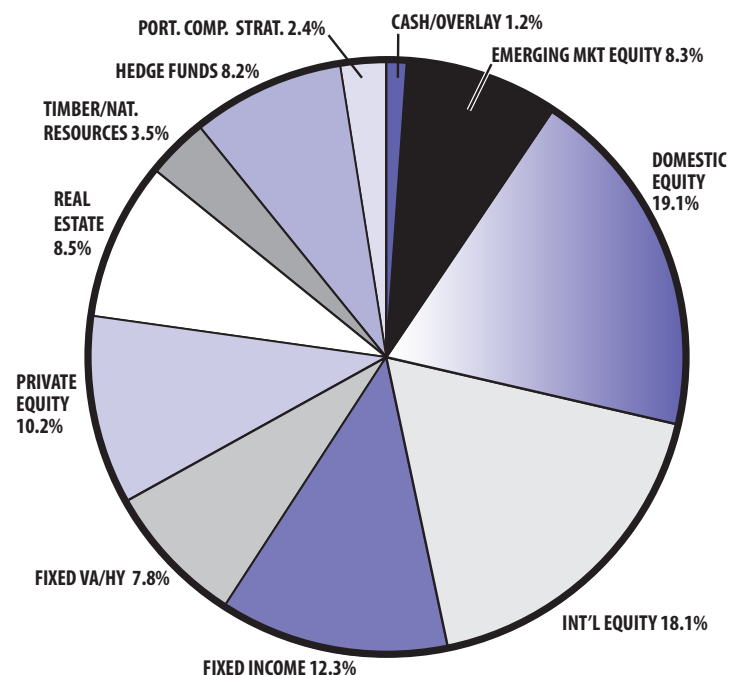
**5 years 2015**  
7.55%

## ACTUARIAL

▶ Funded Ratio	54.6%
▶ Date of Last Valuation	01/17
▶ Actuary	Stone
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2034
▶ Unfunded Liability	\$40.5 M
▶ Total Pension Appropriation (Fiscal 2018)	\$3.8 M

	ACTIVE	RETIRED
▶ Number of Members	281	241
▶ Total Payroll/Benefit	\$12.2 M	\$5.6 M
▶ Average Salary/Benefit	\$43,600	\$23,200
▶ Average Age	47	73
▶ Average Service	12.1 years	NA

## ASSET ALLOCATION (12/31/17)



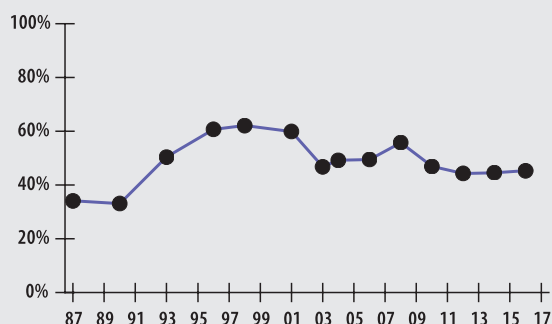
## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	28
▶ Number Who Reported Earnings	4
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

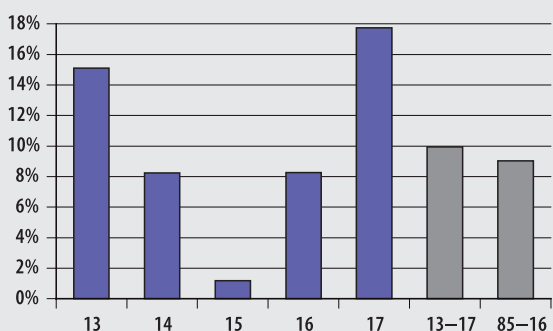
▶ 2017 Return	17.81%
▶ 2017 Market Value	\$55.6 M
▶ 2013-2017 (Annualized)	9.94%
▶ 1985-2017 (Annualized)	9.56%



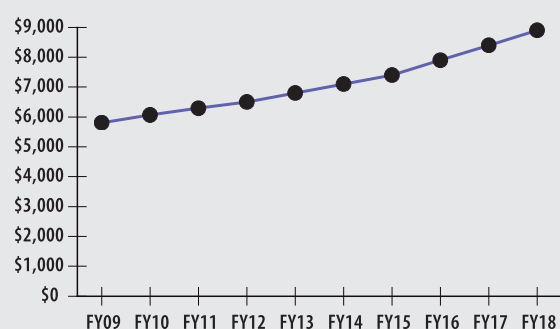
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

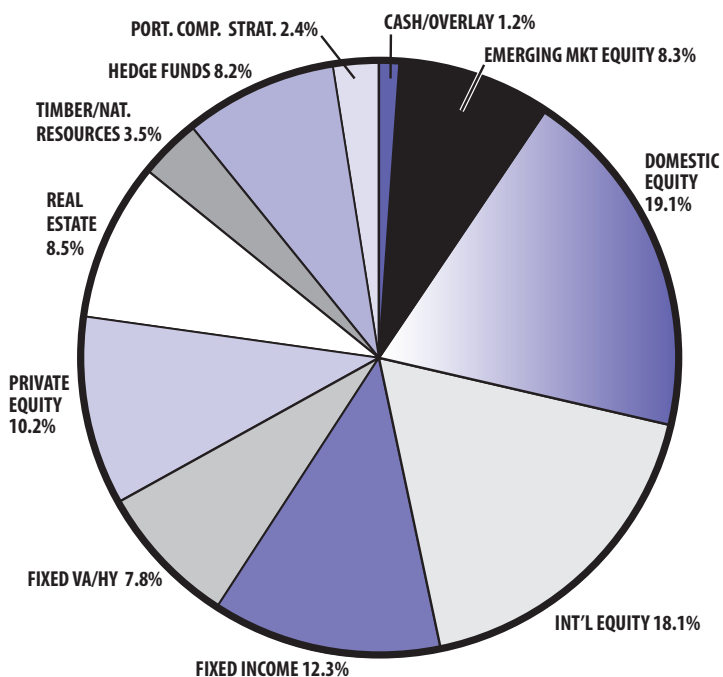
<b>33 years 2017</b>	<b>32 years 2016</b>	<b>31 years 2015</b>
9.04%	8.78%	8.79%
<b>10 years 2017</b>	<b>10 years 2016</b>	<b>10 years 2015</b>
5.66%	4.87%	5.46%
<b>5 years 2017</b>	<b>5 years 2016</b>	<b>5 years 2015</b>
9.95%	9.20%	7.57%

### ACTUARIAL

▶ Funded Ratio	45.3%
▶ Date of Last Valuation	01/16
▶ Actuary	Segal
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	6.75% Total Increasing
▶ Year Fully Funded	2034
▶ Unfunded Liability	\$108.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$8.9 M

	ACTIVE	RETIRED
▶ Number of Members	534	463
▶ Total Payroll/Benefit	\$29.0 M	\$11.2 M
▶ Average Salary/Benefit	\$54,300	\$24,100
▶ Average Age	51	NA
▶ Average Service	12.5 years	NA

### ASSET ALLOCATION (12/31/17)

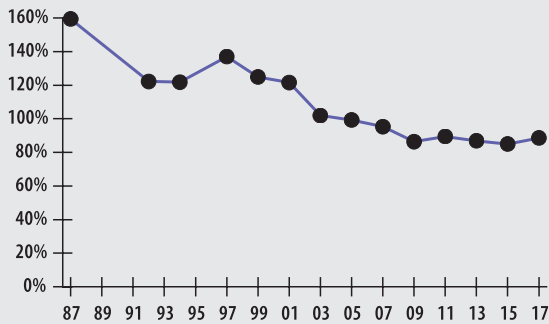


### EARNED INCOME OF DISABILITY RETIREES (2016)

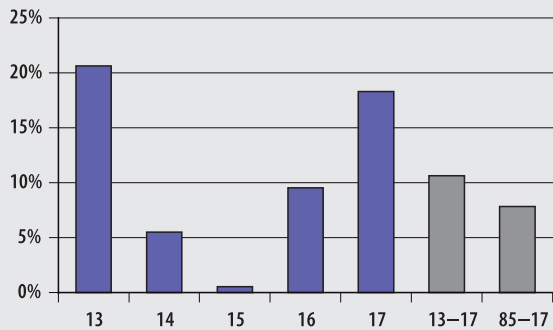
▶ Number of Disability Retirees	49
▶ Number Who Reported Earnings	14
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.75%
▶ 2017 Market Value	\$107.3 M
▶ 2013-2017 (Annualized)	9.95%
▶ 1985-2017 (Annualized)	9.04%

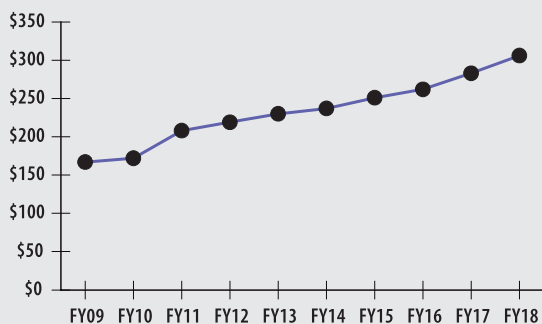
#### FUNDED RATIO (1987-2017)



#### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



#### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



#### INVESTMENT RETURN HISTORY

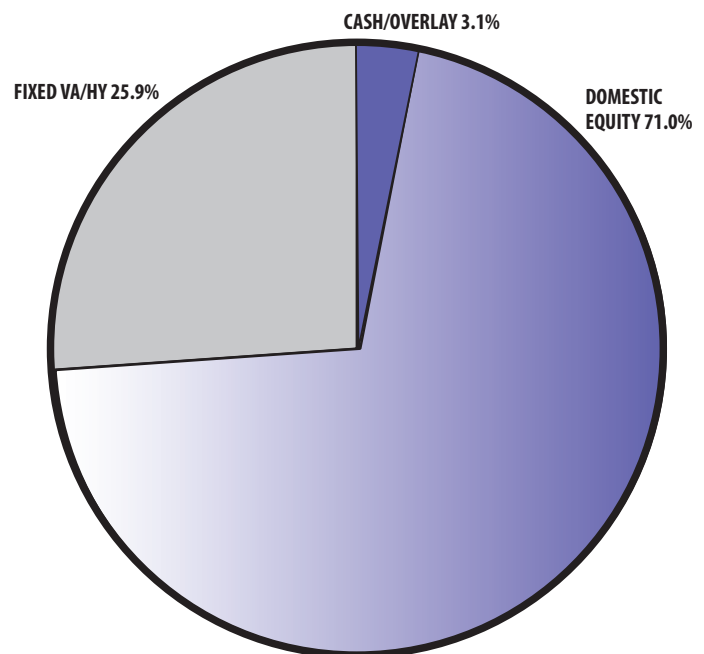
<b>33 years 2017</b> 7.84%	<b>32 years 2016</b> 7.53%	<b>31 years 2015</b> 7.46%
<b>10 years 2017</b> 7.56%	<b>10 years 2016</b> 6.64%	<b>10 years 2015</b> 6.61%
<b>5 years 2017</b> 10.65%	<b>5 years 2016</b> 9.23%	<b>5 years 2015</b> 7.31%

#### ACTUARIAL

▶ Funded Ratio	88.6%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.00%
▶ Funding Schedule	8.0% Total Increasing
▶ Year Fully Funded	2034
▶ Unfunded Liability	\$2.1 M
▶ Total Pension Appropriation (Fiscal 2018)	\$306,000

	ACTIVE	RETIRED
▶ Number of Members	38	26
▶ Total Payroll/Benefit	\$2.5 M	\$757,000
▶ Average Salary/Benefit	\$67,000	\$29,100
▶ Average Age	52	72
▶ Average Service	18.9 years	NA

#### ASSET ALLOCATION (12/31/17)



#### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	1
▶ Number Who Reported Earnings	0
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	18.32%
▶ 2017 Market Value	\$18.5 M
▶ 2013-2017 (Annualized)	10.65%
▶ 1985-2017 (Annualized)	7.84%

## Greenfield

Town Hall  
14 Court Square  
Greenfield, MA 01301  
Phone 413-772-1503  
Fax 413-772-1582

### Board Members

William P. Devino (Chairperson),  
Elizabeth Braccia, Marilyn Matysiewicz,  
Betty L. Rice, Frances K. Stotz

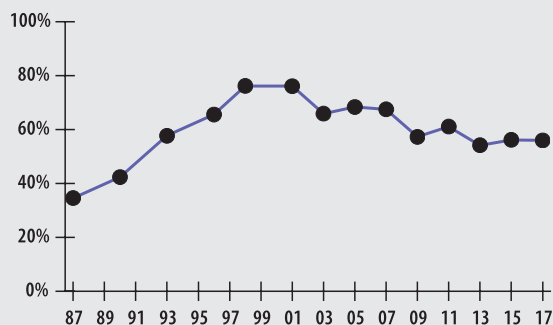
### Board Administrator

Shari Hildreth

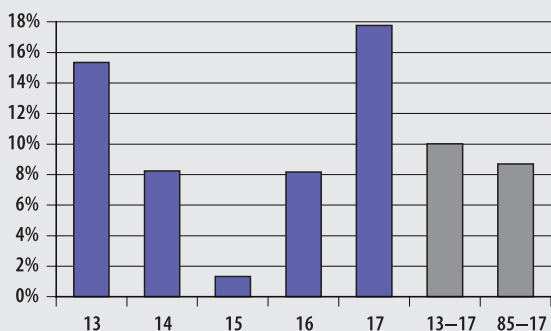
### Board Meeting

Varies

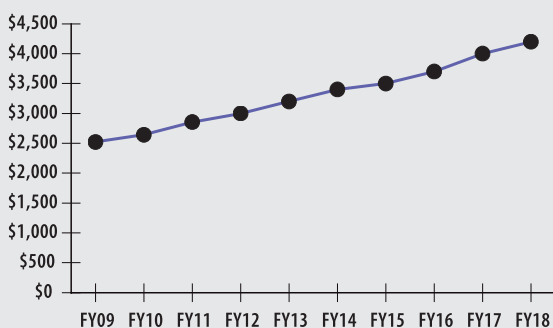
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

8.69%

#### 32 years 2016

8.42%

#### 31 years 2015

8.42%

#### 10 years 2017

5.99%

#### 10 years 2016

5.19%

#### 10 years 2015

5.72%

#### 5 years 2017

10.01%

#### 5 years 2016

9.35%

#### 5 years 2015

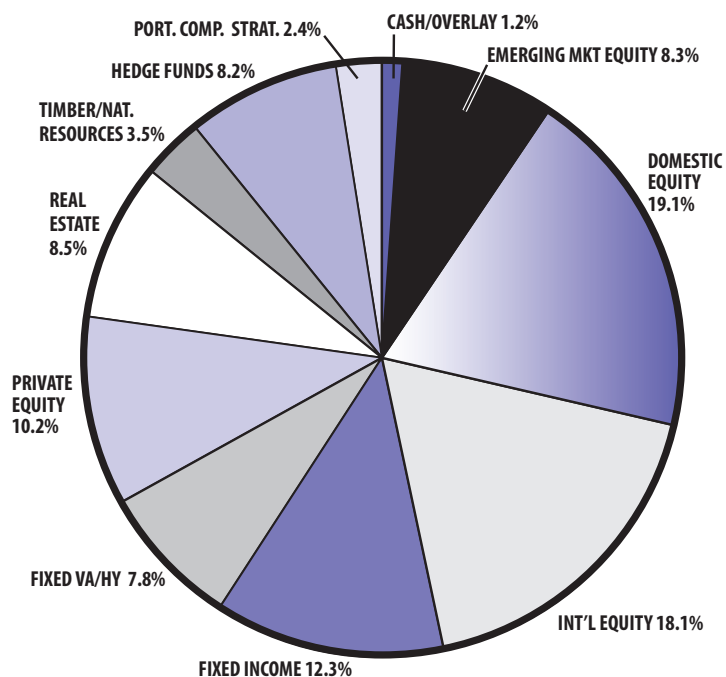
7.74%

## ACTUARIAL

▶ Funded Ratio	56.0%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.40%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$49.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$4.2 M

	ACTIVE	RETIRED
▶ Number of Members	457	277
▶ Total Payroll/Benefit	\$18.5 M	\$6.5 M
▶ Average Salary/Benefit	\$40,600	\$23,300
▶ Average Age	46	71
▶ Average Service	8.9 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	22
▶ Number Who Reported Earnings	6
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.77%
▶ 2017 Market Value	\$70.5 M
▶ 2013-2017 (Annualized)	10.01%
▶ 1985-2017 (Annualized)	8.69%

## Hampden County Regional

Agawam Corporate Center  
67 Hunt Street, Suite 116  
Agawam, MA 01001  
Phone 413-737-1344  
Fax 413-732-7999

### Board Members

Richard M. Theroux (Chairperson),  
Patricia C. Donovan, Patrick O'Neil,  
Laurel Placzek, Karl Schmaelzle

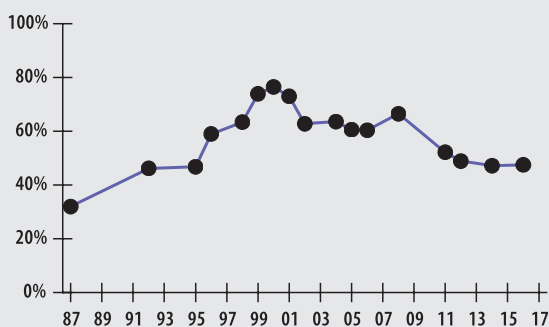
### Board Administrator

Julianne Bartley

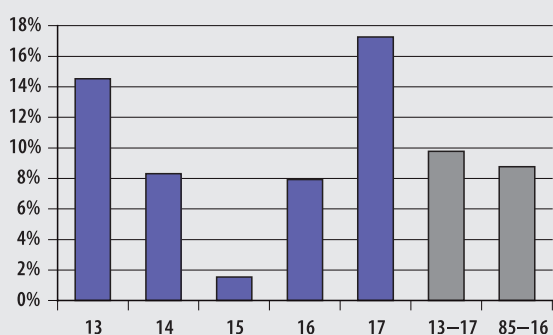
### Board Meeting

Next to the last business day of each month

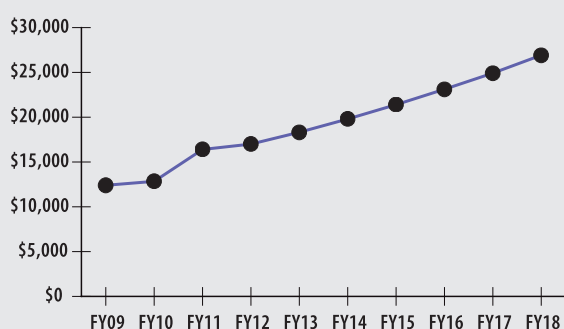
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.77%

**32 years 2016**  
8.52%

**31 years 2015**  
8.54%

**10 years 2017**  
5.89%

**10 years 2016**  
4.89%

**10 years 2015**  
5.37%

**5 years 2017**  
9.78%

**5 years 2016**  
8.99%

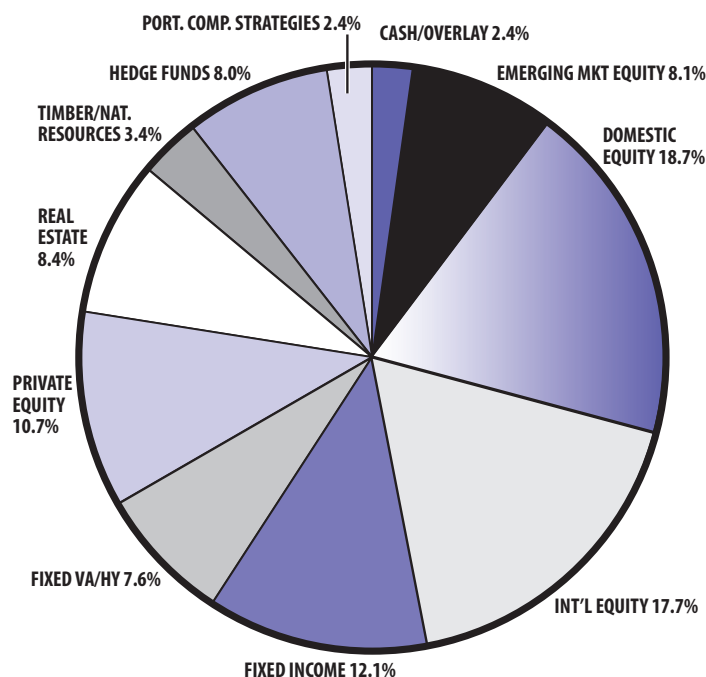
**5 years 2015**  
7.57%

## ACTUARIAL

▶ Funded Ratio	47.5%
▶ Date of Last Valuation	01/16
▶ Actuary	Segal
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2036
▶ Unfunded Liability	\$344.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$26.9 M

	ACTIVE	RETIRED
▶ Number of Members	2,582	1,657
▶ Total Payroll/Benefit	\$103.0 M	\$33.3M
▶ Average Salary/Benefit	\$39,900	\$20,100
▶ Average Age	49	73
▶ Average Service	12.0 years	NA

## ASSET ALLOCATION (12/31/17)

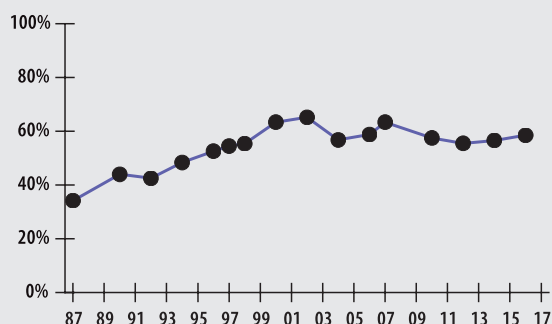


## EARNED INCOME OF DISABILITY RETIREES (2016)

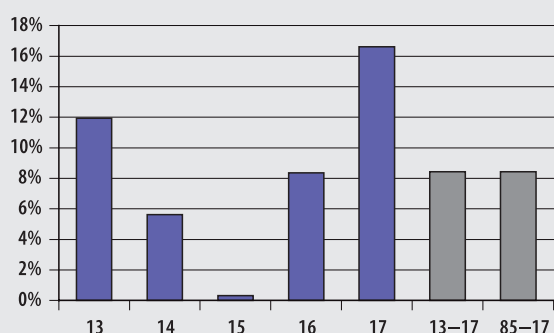
▶ Number of Disability Retirees	117
▶ Number Who Reported Earnings	29
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.27%
▶ 2017 Market Value	\$368.6 M
▶ 2013-2017 (Annualized)	9.78%
▶ 1985-2017 (Annualized)	8.77%

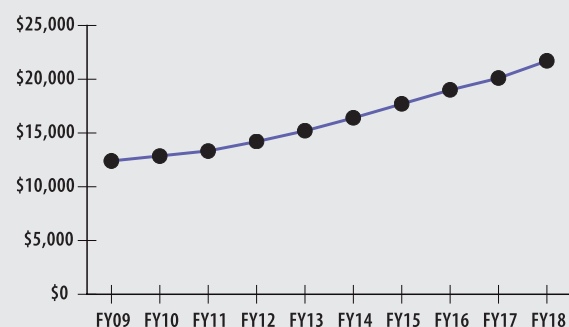
## FUNDED RATIO (1987-2017)



## INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



## 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



## INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 8.44%	<b>32 years 2016</b> 8.19%	<b>31 years 2015</b> 8.19%
<b>10 years 2017</b> 6.05%	<b>10 years 2016</b> 5.02%	<b>10 years 2015</b> 5.67%
<b>5 years 2017</b> 8.43%	<b>5 years 2016</b> 8.05%	<b>5 years 2015</b> 6.48%

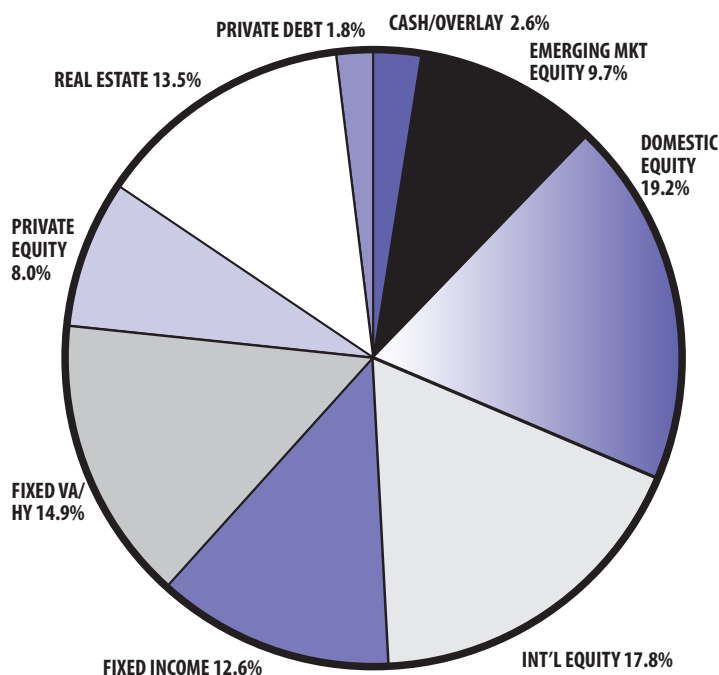
## ACTUARIAL

▶ Funded Ratio	58.5%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	4.0% Increasing Phase-In
▶ Year Fully Funded	2034
▶ Unfunded Liability	\$192.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$21.7 M

	ACTIVE	RETIRED
▶ Number of Members	1,816	1,210
▶ Total Payroll/Benefit	\$75.4 M	\$23.8 M
▶ Average Salary/Benefit	\$41,500	\$19,700
▶ Average Age	49	72
▶ Average Service	12.0 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	83
▶ Number Who Reported Earnings	32
▶ Number of Excess Earners	1
▶ Total Amount of Refund Due	\$8,605.80

▶ 2017 Return	16.62%
▶ 2017 Market Value	\$317.3 M
▶ 2013-2017 (Annualized)	8.43%
▶ 1985-2017 (Annualized)	8.44%

## Haverhill

4 Summer Street  
Room 303  
Haverhill, MA 01830-5843  
Phone 978-374-2358  
Fax 978-374-2353

### Board Members

William J. Klueber (Chairperson),  
Charles Benevento, James P. Cleary, III, Esq.,  
Richard MacDonald, Lewis F. Poore, Jr.

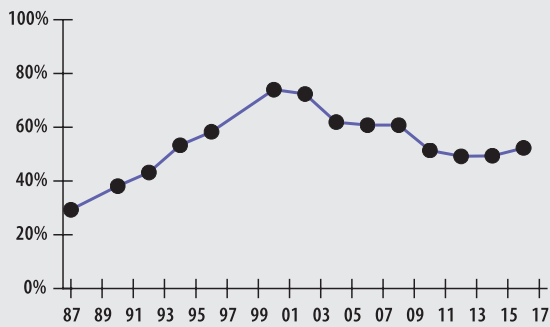
### Board Administrator

David Van Dam

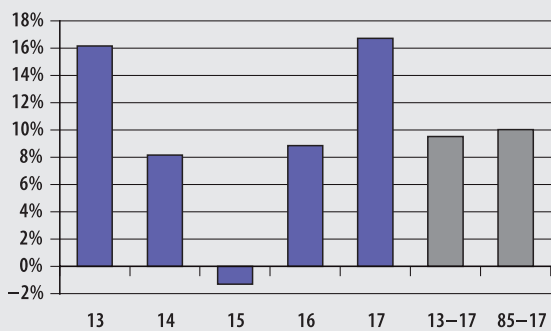
### Board Meeting

Second Tuesday each month at 9:00 am

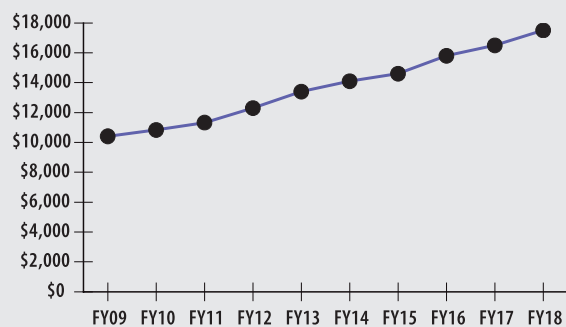
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

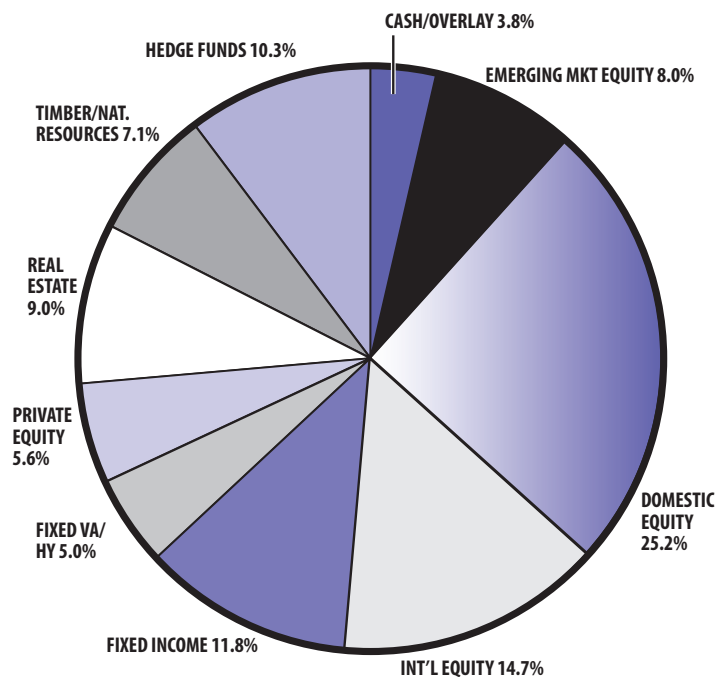
<b>33 years 2017</b>	<b>32 years 2016</b>	<b>31 years 2015</b>
10.05%	9.85%	9.88%
<b>10 years 2017</b>	<b>10 years 2016</b>	<b>10 years 2015</b>
6.06%	5.60%	6.15%
<b>5 years 2017</b>	<b>5 years 2016</b>	<b>5 years 2015</b>
9.52%	8.73%	6.93%

## ACTUARIAL

▶ Funded Ratio	52.3%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	4.0% Increasing
▶ Year Fully Funded	2032
▶ Unfunded Liability	\$165.6 M
▶ Total Pension Appropriation (Fiscal 2018)	\$17.5 M

	ACTIVE	RETIRED
▶ Number of Members	887	1,074
▶ Total Payroll/Benefit	\$38.3 M	\$23.8 M
▶ Average Salary/Benefit	\$43,100	\$22,100
▶ Average Age	48	73
▶ Average Service	12.7 years	NA

## ASSET ALLOCATION (12/31/17)

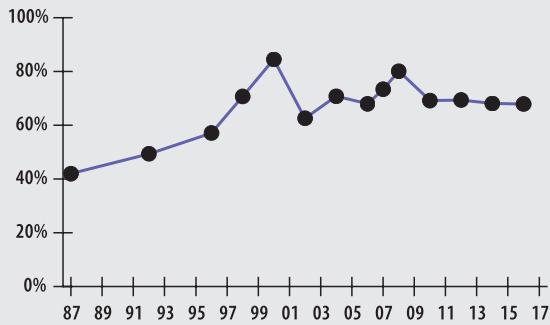


## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	96
▶ Number Who Reported Earnings	20
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	16.74%
▶ 2017 Market Value	\$201.6 M
▶ 2013-2017 (Annualized)	9.52%
▶ 1985-2017 (Annualized)	10.05%

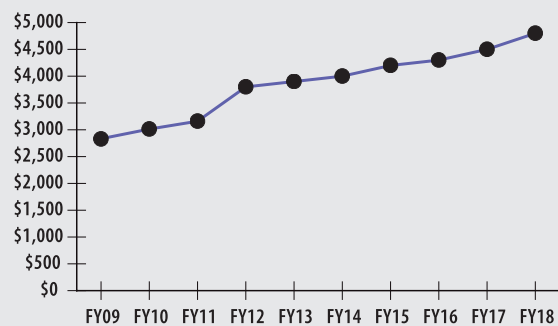
## FUNDED RATIO (1987-2017)



## INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



## 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



## INVESTMENT RETURN HISTORY

<b>33 years 2017</b>	<b>32 years 2016</b>	<b>31 years 2015</b>
9.26%	9.00%	9.01%
<b>10 years 2017</b>	<b>10 years 2016</b>	<b>10 years 2015</b>
5.11%	4.56%	5.32%
<b>5 years 2017</b>	<b>5 years 2016</b>	<b>5 years 2015</b>
9.00%	7.89%	6.31%

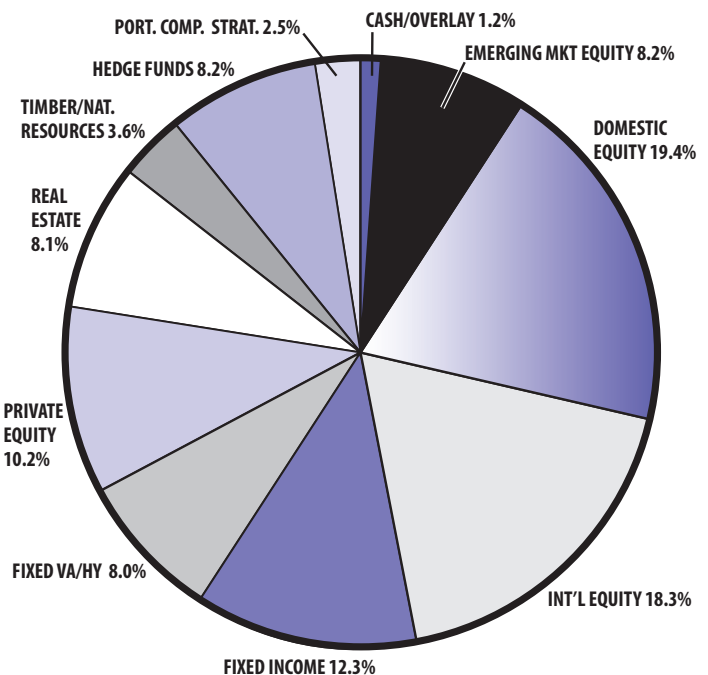
## ACTUARIAL

▶ Funded Ratio	67.9%
▶ Date of Last Valuation	01/16
▶ Actuary	KMS
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.0% Increasing Phase-In
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$47.8 M
▶ Total Pension Appropriation (Fiscal 2018)	\$4.8 M

	ACTIVE	RETIRED
▶ Number of Members	648	317
▶ Total Payroll/Benefit	\$30.2 M	\$7.7 M
▶ Average Salary/Benefit	\$46,600	\$24,300
▶ Average Age	48	74
▶ Average Service	9.8 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	12
▶ Number Who Reported Earnings	1
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	18.05%
▶ 2017 Market Value	\$119.3 M
▶ 2013-2017 (Annualized)	9.00%
▶ 1985-2017 (Annualized)	9.26%

## Board Members

John T. McCarthy (Chairperson),  
Michele Aubrey, Rory Casey,  
Anthony Dulude, Bellamy Schmidt

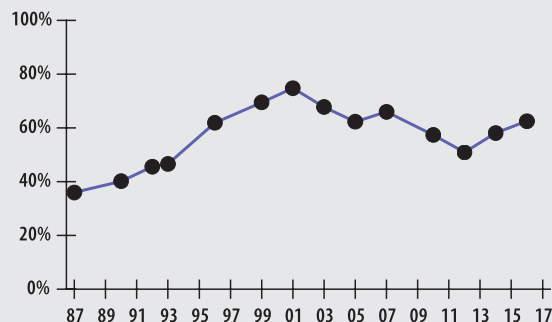
## Board Administrator

Cheryl A. Dugre

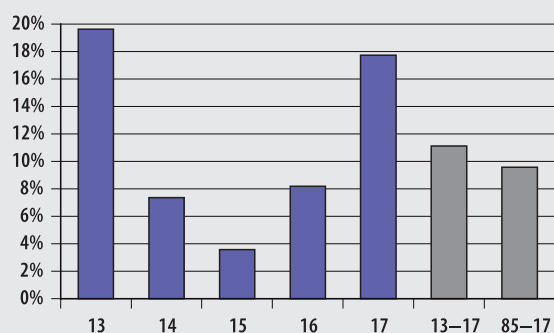
## Board Meeting

Third Tuesday of each month at 9:00 am

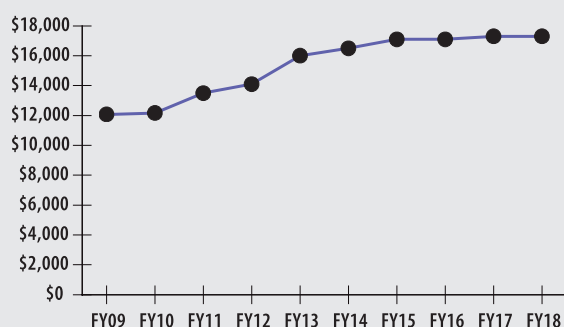
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.58%

#### 32 years 2016

9.33%

#### 31 years 2015

9.37%

#### 10 years 2017

7.14%

#### 10 years 2016

6.16%

#### 10 years 2015

6.51%

#### 5 years 2017

11.14%

#### 5 years 2016

10.98%

#### 5 years 2015

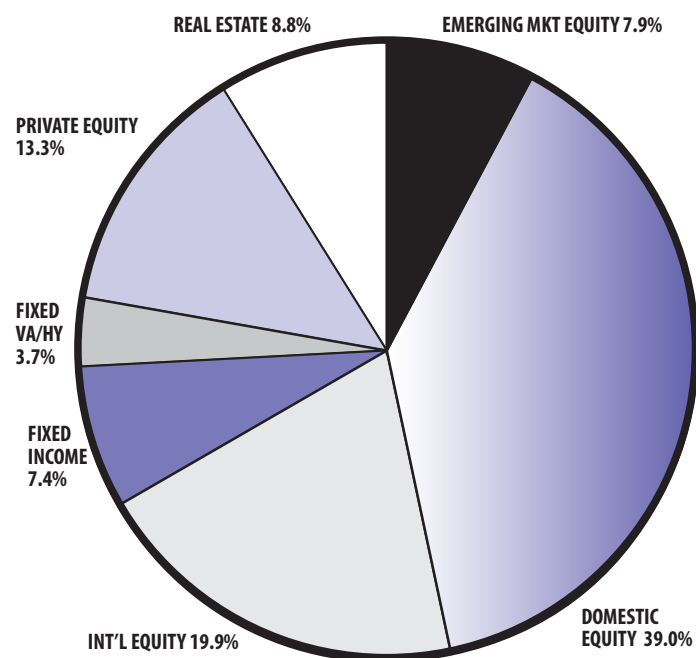
9.23%

## ACTUARIAL

▶ Funded Ratio	62.5%
▶ Date of Last Valuation	01/16
▶ Actuary	Segal
▶ Assumed Rate of Return	7.63%
▶ Funding Schedule	3.67% Total Increasing
▶ Year Fully Funded	2032
▶ Unfunded Liability	\$148.1 M
▶ Total Pension Appropriation (Fiscal 2018)	\$17.3 M

	ACTIVE	RETIRED
▶ Number of Members	1,138	935
▶ Total Payroll/Benefit	\$53.8 M	\$23.7 M
▶ Average Salary/Benefit	\$47,200	\$25,300
▶ Average Age	46	NA
▶ Average Service	12.7 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	90
▶ Number Who Reported Earnings	13
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.75%
▶ 2017 Market Value	\$290.5 M
▶ 2013-2017 (Annualized)	11.14%
▶ 1985-2017 (Annualized)	9.58%



**Board Members**

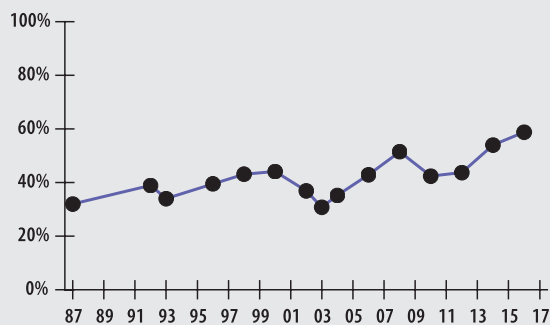
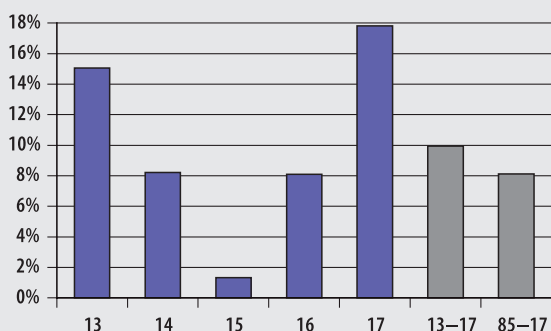
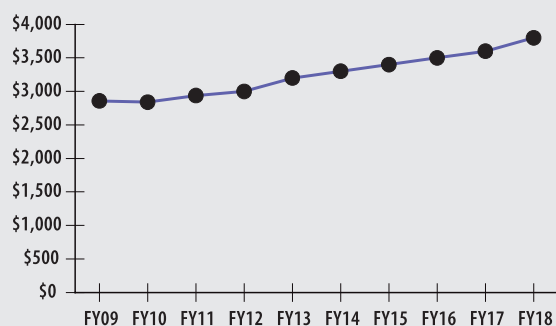
J. Michael Buckley (Chairperson),  
Gregory Galvin, John J. King,  
John Reilly, Jr., Brian Thompson

**Board Administrator**

Lauren Durham

**Board Meeting**

Last Wednesday of the month

**FUNDED RATIO (1987-2017)****INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)****10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)****INVESTMENT RETURN HISTORY****33 years 2017**

8.12%

**32 years 2016**

7.83%

**31 years 2015**

7.82%

**10 years 2017**

5.62%

**10 years 2016**

5.09%

**10 years 2015**

5.88%

**5 years 2017**

9.95%

**5 years 2016**

9.20%

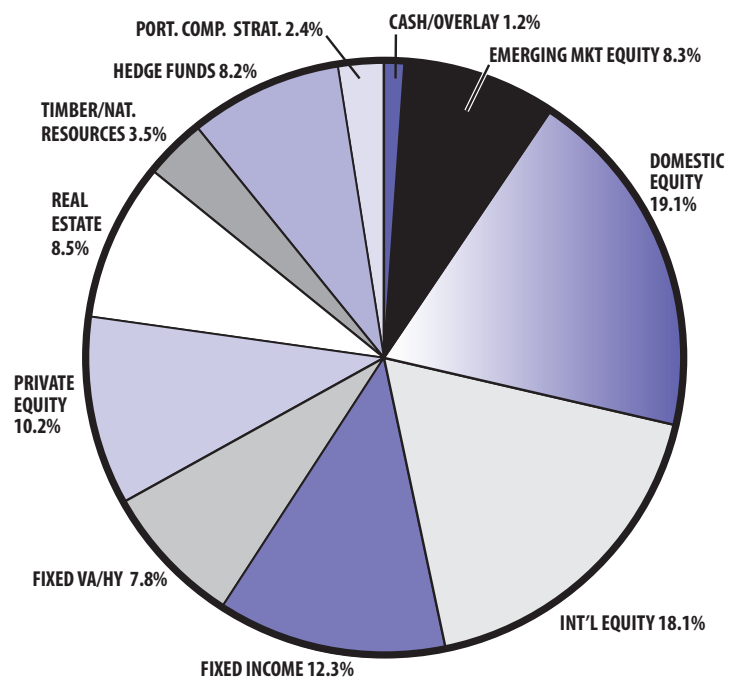
**5 years 2015**

7.54%

**ACTUARIAL**

▶ Funded Ratio	58.8%
▶ Date of Last Valuation	01/16
▶ Actuary	Odyssey
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	3.74% Increasing
▶ Year Fully Funded	2032
▶ Unfunded Liability	\$27.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$3.8 M

	ACTIVE	RETIRED
▶ Number of Members	177	143
▶ Total Payroll/Benefit	\$9.7 M	\$3.9 M
▶ Average Salary/Benefit	\$54,800	\$27,000
▶ Average Age	51	NA
▶ Average Service	10.7 years	NA

**ASSET ALLOCATION (12/31/17)****EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	23
▶ Number Who Reported Earnings	9
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.83%
▶ 2017 Market Value	\$48.4 M
▶ 2013-2017 (Annualized)	9.95%
▶ 1985-2017 (Annualized)	8.12%

## Lawrence

354 Merrimack Street  
Suite 302, Entry C  
Lawrence, MA 01843  
Phone 978-620-3570  
Fax 978-683-5894

### Board Members

William F. Bateman (Chairperson),  
Ramona Ceballos, Thomas M. Cuddy,  
Kevin Loughlin, Gina M. Rizzo

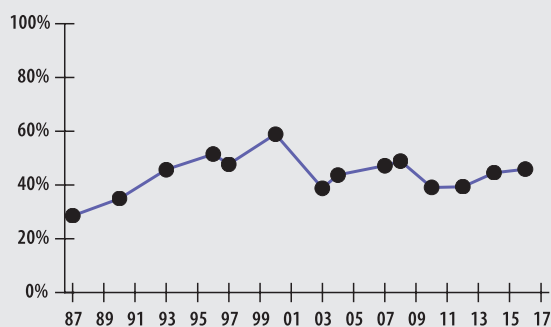
### Board Administrator

Diane Cockroft

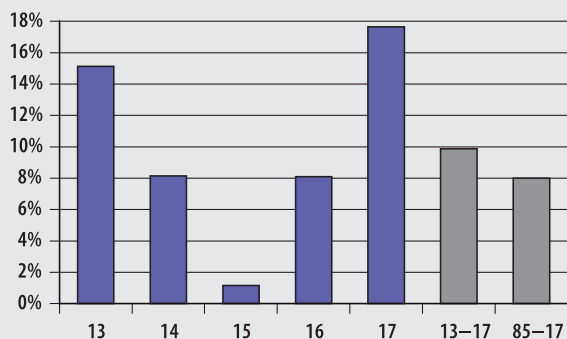
### Board Meeting

Varies

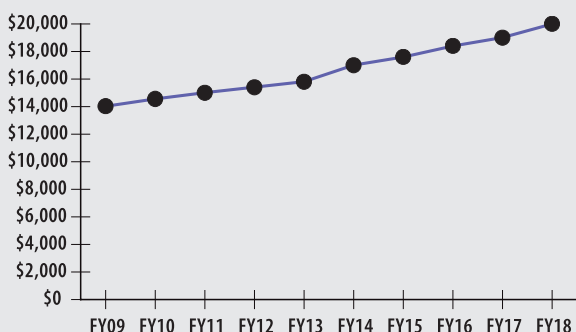
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.00%

**32 years 2016**  
7.71%

**31 years 2015**  
7.70%

**10 years 2017**  
5.63%

**10 years 2016**  
4.87%

**10 years 2015**  
5.29%

**5 years 2017**  
9.88%

**5 years 2016**  
9.15%

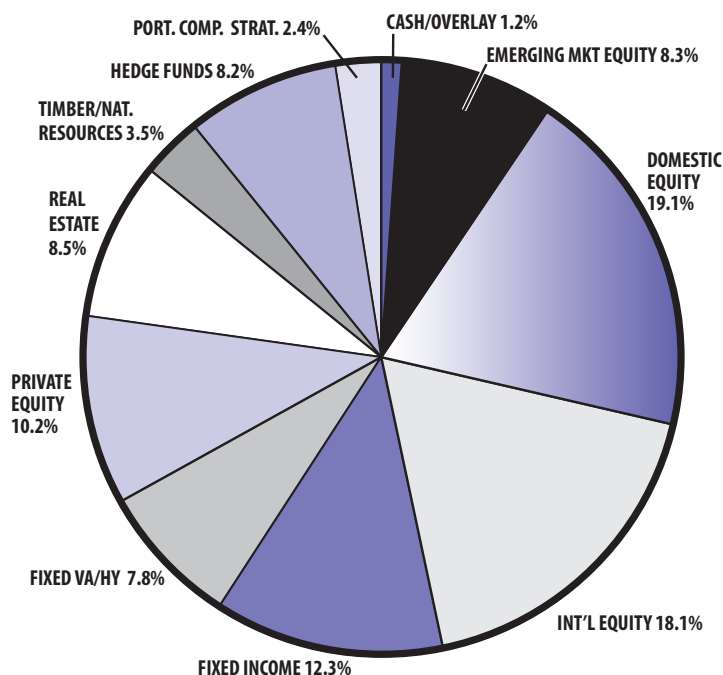
**5 years 2015**  
7.52%

## ACTUARIAL

▶ Funded Ratio	45.9%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	3.6% Increasing
▶ Year Fully Funded	2037
▶ Unfunded Liability	\$215.4 M
▶ Total Pension Appropriation (Fiscal 2018)	\$20.0 M

	ACTIVE	RETIRED
▶ Number of Members	1,600	887
▶ Total Payroll/Benefit	\$70.0 M	\$23.0 M
▶ Average Salary/Benefit	\$43,700	\$26,000
▶ Average Age	44	74
▶ Average Service	10.6 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	124
▶ Number Who Reported Earnings	24
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.65%
▶ 2017 Market Value	\$228.4 M
▶ 2013-2017 (Annualized)	9.88%
▶ 1985-2017 (Annualized)	8.00%

## Leominster

City Hall, Room 15  
25 West Street  
Leominster, MA 01453  
Phone 978-534-7507, ext. 246  
Fax 978-534-7508

### Board Members

John J. Richard (Chairperson),  
Douglas Farwell, David R. LaPlante,  
John P. Perry, William Thibodeau

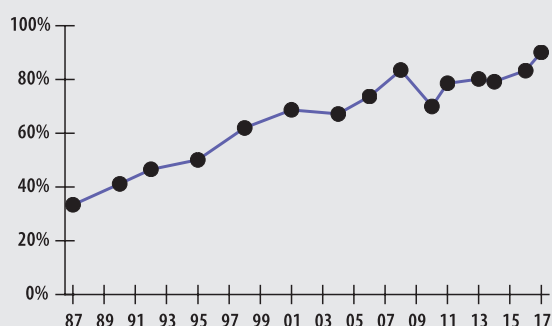
### Board Administrator

Erin S. Kelley

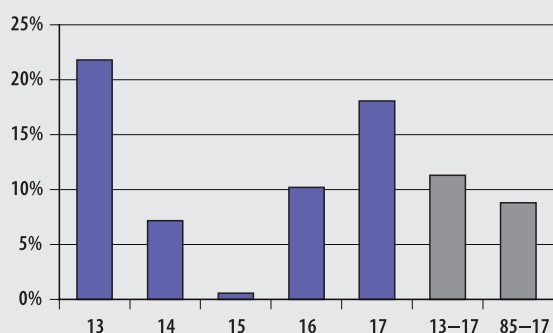
### Board Meeting

Varies

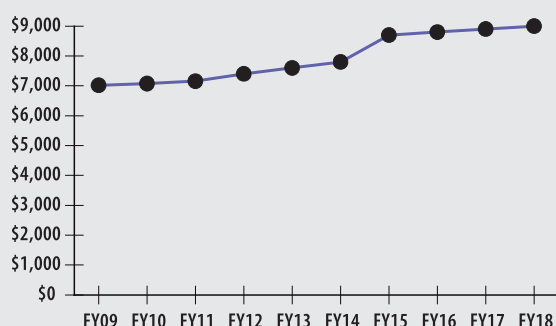
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

8.83%

#### 32 years 2016

8.55%

#### 31 years 2015

8.50%

#### 10 years 2017

6.42%

#### 10 years 2016

5.75%

#### 10 years 2015

6.35%

#### 5 years 2017

11.32%

#### 5 years 2016

10.74%

#### 5 years 2015

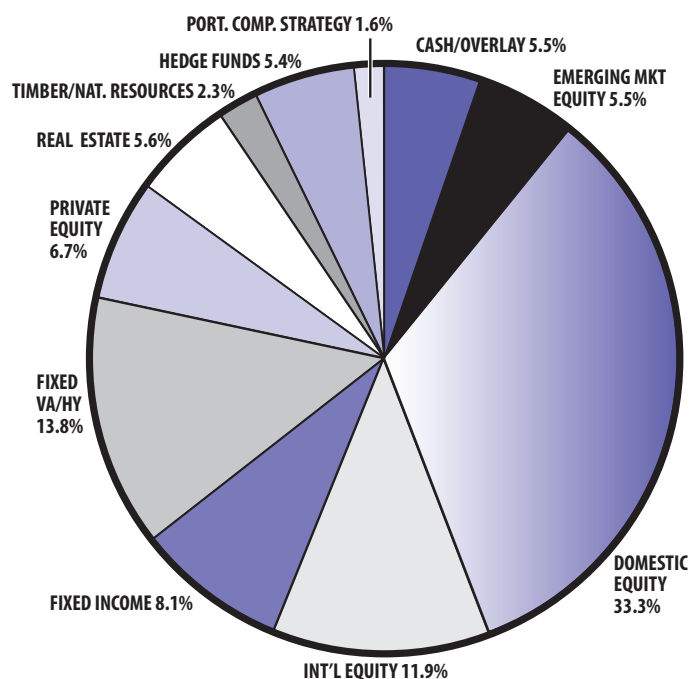
8.25%

## ACTUARIAL

▶ Funded Ratio	90.1%
▶ Date of Last Valuation	01/17
▶ Actuary	Stone
▶ Assumed Rate of Return	5.50%
▶ Funding Schedule	Level
▶ Year Fully Funded	2021
▶ Unfunded Liability	\$19.2 M
▶ Total Pension Appropriation (Fiscal 2018)	\$9.0 M

	ACTIVE	RETIRED
▶ Number of Members	633	390
▶ Total Payroll/Benefit	\$29.1 M	\$8.8 M
▶ Average Salary/Benefit	\$45,900	\$22,600
▶ Average Age	46	73
▶ Average Service	11.4 years	NA

## ASSET ALLOCATION (12/31/17)

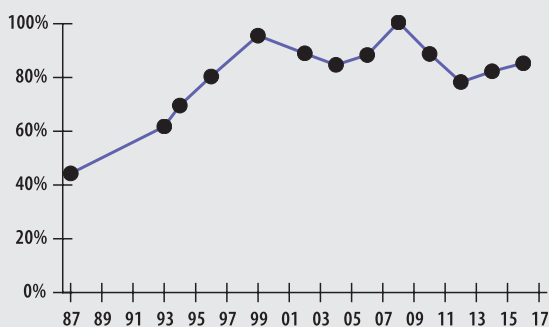


## EARNED INCOME OF DISABILITY RETIREES (2016)

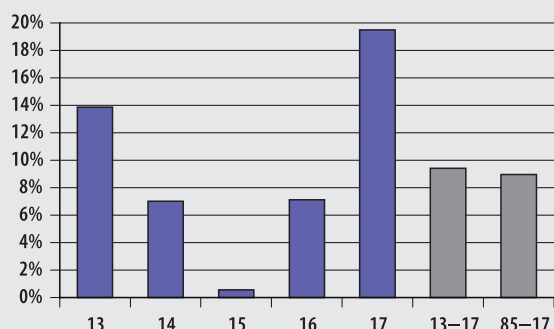
▶ Number of Disability Retirees	42
▶ Number Who Reported Earnings	12
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	18.08%
▶ 2017 Market Value	\$207.6 M
▶ 2013-2017 (Annualized)	11.32%
▶ 1985-2017 (Annualized)	8.83%

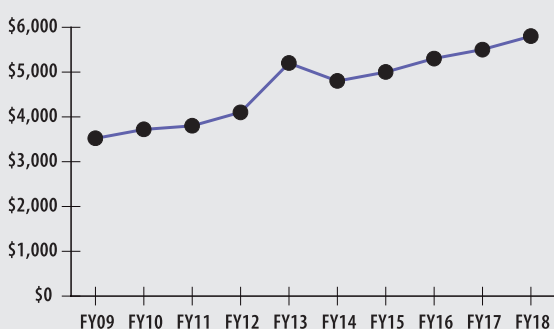
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

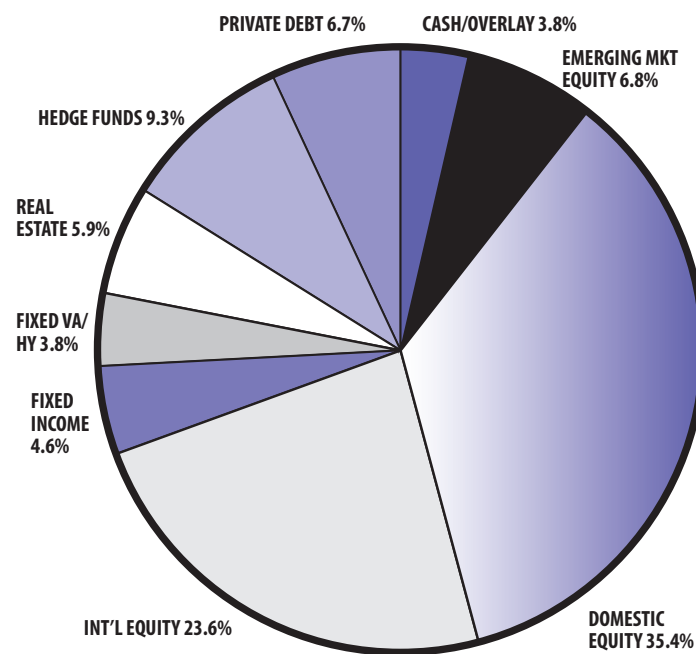
<b>33 years 2017</b> 8.96%	<b>32 years 2016</b> 8.64%	<b>31 years 2015</b> 8.69%
<b>10 years 2017</b> 5.04%	<b>10 years 2016</b> 4.48%	<b>10 years 2015</b> 5.18%
<b>5 years 2017</b> 9.43%	<b>5 years 2016</b> 8.51%	<b>5 years 2015</b> 5.75%

## ACTUARIAL

▶ Funded Ratio	85.3%
▶ Date of Last Valuation	01/16
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	4.0% Increasing Phase-In
▶ Year Fully Funded	2024
▶ Unfunded Liability	\$24.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$5.8 M

	ACTIVE	RETIRED
▶ Number of Members	678	411
▶ Total Payroll/Benefit	\$36.1 M	\$9.9 M
▶ Average Salary/Benefit	\$53,300	\$24,200
▶ Average Age	NA	73
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	23
▶ Number Who Reported Earnings	10
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	19.50%
▶ 2017 Market Value	\$168.7 M
▶ 2013-2017 (Annualized)	9.43%
▶ 1985-2017(Annualized)	8.96%

## Lowell

City Hall, Room 3  
375 Merrimack Street  
Lowell, MA 01852-5998  
Phone 978-674-4094  
Fax 978-446-7019

### Board Members

Joseph Mahoney (Chairperson),  
Michael M. Brennan, William Desrosiers,  
David Keene, Bryan T. Perry

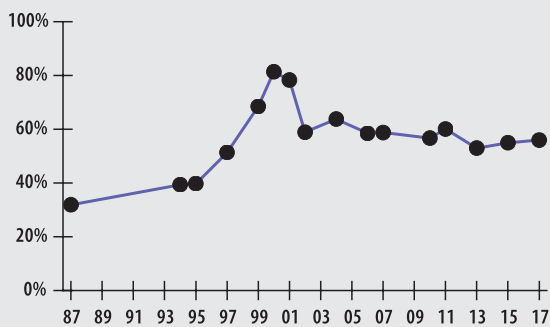
### Board Administrator

Shannon Dowd

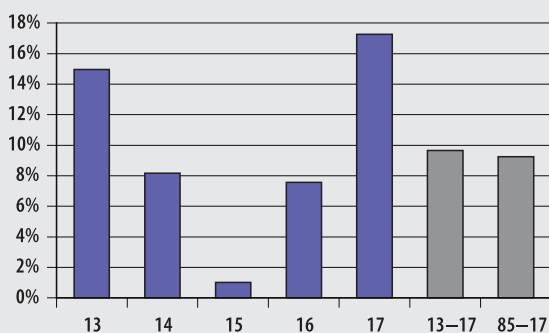
### Board Meeting

Varies

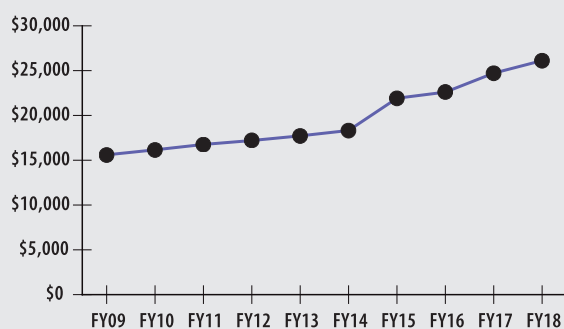
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
9.24%

**32 years 2016**  
8.99%

**31 years 2015**  
9.04%

**10 years 2017**  
5.36%

**10 years 2016**  
4.86%

**10 years 2015**  
5.73%

**5 years 2017**  
9.65%

**5 years 2016**  
8.94%

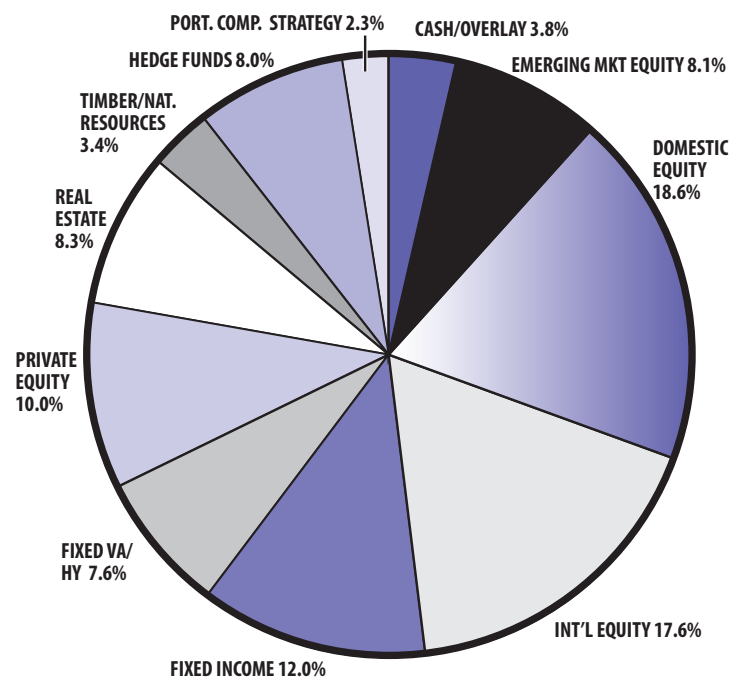
**5 years 2015**  
7.42%

## ACTUARIAL

▶ Funded Ratio	56.0%
▶ Date of Last Valuation	01/17
▶ Actuary	KMS
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.0% increasing Phase-in
▶ Year Fully Funded	2036
▶ Unfunded Liability	\$269.8 M
▶ Total Pension Appropriation (Fiscal 2018)	\$26.1 M

	ACTIVE	RETIRED
▶ Number of Members	1,693	1,226
▶ Total Payroll/Benefit	\$92.8 M	\$35.9 M
▶ Average Salary/Benefit	\$54,800	\$29,300
▶ Average Age	47	72
▶ Average Service	13.1 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	197
▶ Number Who Reported Earnings	45
▶ Number of Excess Earners	3
▶ Total Amount of Refund Due	\$28,729.39

▶ 2017 Return	17.27%
▶ 2017 Market Value	\$379.6 M
▶ 2013-2017 (Annualized)	9.65%
▶ 1985-2017 (Annualized)	9.24%

**Board Members**

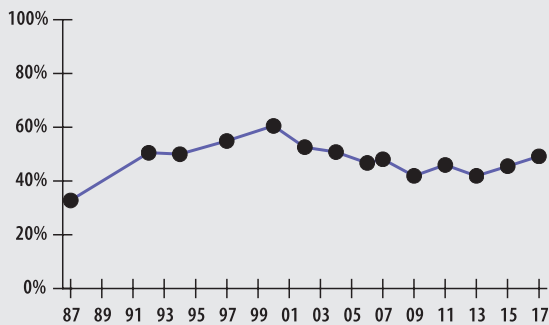
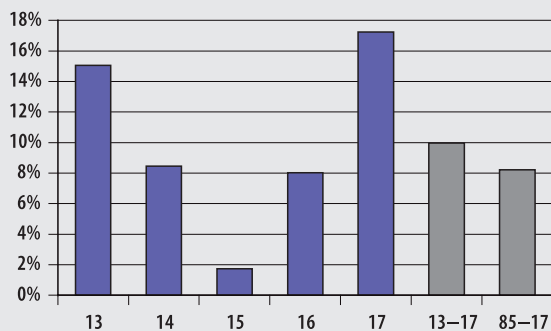
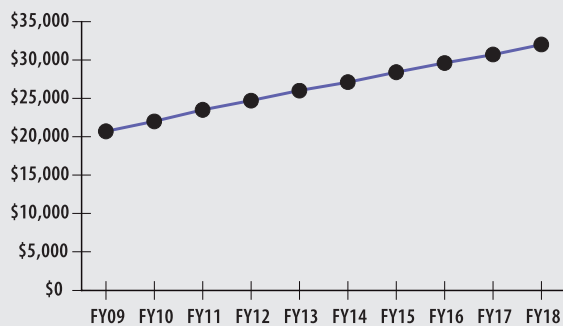
Michael J. Marks, Esq. (Chairperson),  
Gordon "Buzzy" Barton, Richard Biagiotti,  
Stephen Spencer, Frank Valeri

**Board Administrator**

Gary Brenner

**Board Meeting**

Last Tuesday of each month at 9:30 am

**FUNDED RATIO (1987-2017)****INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)****10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)****INVESTMENT RETURN HISTORY****33 years 2017**

8.21%

**32 years 2016**

7.94%

**31 years 2015**

7.94%

**10 years 2017**

5.34%

**10 years 2016**

4.69%

**10 years 2015**

4.98%

**5 years 2017**

9.97%

**5 years 2016**

9.25%

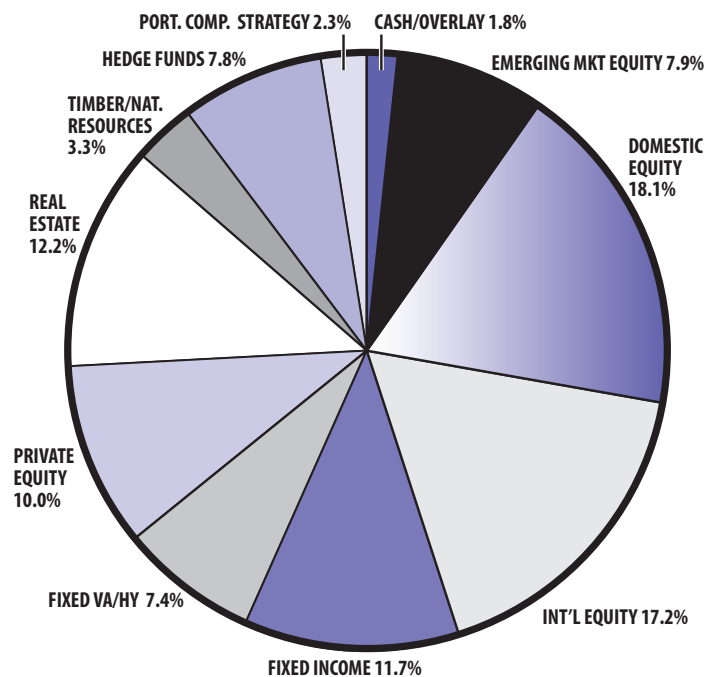
**5 years 2015**

7.94%

**ACTUARIAL**

▶ Funded Ratio	49.2%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.40%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2034
▶ Unfunded Liability	\$321.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$32.0 M

	ACTIVE	RETIRED
▶ Number of Members	1,322	1,187
▶ Total Payroll/Benefit	\$75.8 M	\$36.0 M
▶ Average Salary/Benefit	\$57,300	\$30,300
▶ Average Age	50	75
▶ Average Service	15.3 years	NA

**ASSET ALLOCATION (12/31/17)****EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	186
▶ Number Who Reported Earnings	34
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.24%
▶ 2017 Market Value	\$355.3 M
▶ 2013-2017 (Annualized)	9.97%
▶ 1985-2017 (Annualized)	8.21%

## Malden

17 Pleasant Street, 2<sup>nd</sup> Floor  
Malden, MA 02148  
Phone 781-397-7086  
Fax 781-397-7358

### Board Members

Warren Atkinson, Jr. (Chairperson),  
Douglas Eisnor, Dominic Fermano,  
Gregory Lucey, Charles Ranaghan

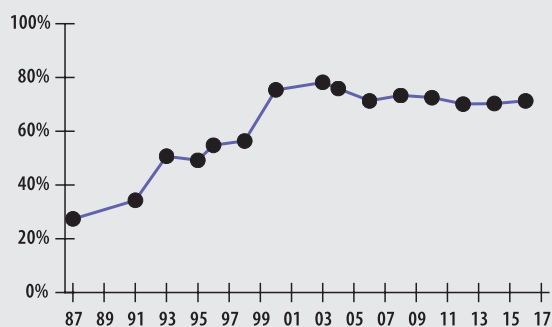
### Board Administrator

James M. Ryan

### Board Meeting

Third Wednesday of each month

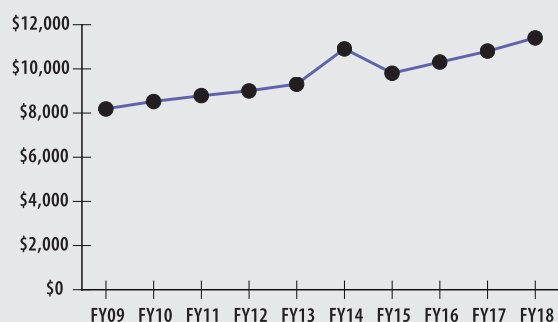
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.68%

#### 32 years 2016

9.36%

#### 31 years 2015

9.70%

#### 10 years 2017

6.44%

#### 10 years 2016

6.04%

#### 10 years 2015

7.02%

#### 5 years 2017

9.21%

#### 5 years 2016

7.49%

#### 5 years 2015

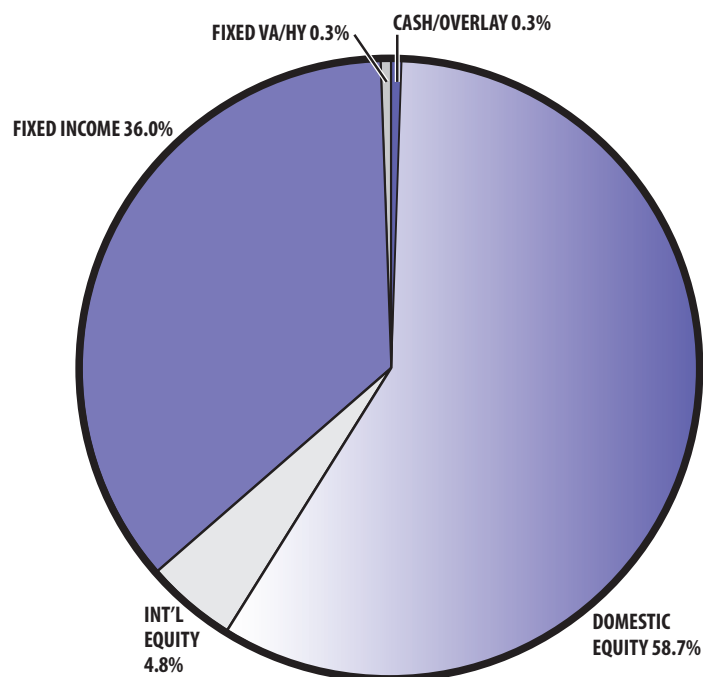
8.29%

## ACTUARIAL

▶ Funded Ratio	71.3%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	5.69% Total Increasing
▶ Year Fully Funded	2030
▶ Unfunded Liability	\$90.8 M
▶ Total Pension Appropriation (Fiscal 2018)	\$11.4 M

	ACTIVE	RETIRED
▶ Number of Members	769	678
▶ Total Payroll/Benefit	\$39.9 M	\$18.6 M
▶ Average Salary/Benefit	\$51,800	\$27,400
▶ Average Age	49	73
▶ Average Service	13.3 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	112
▶ Number Who Reported Earnings	21
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	20.24%
▶ 2017 Market Value	\$251.6 M
▶ 2013-2017 (Annualized)	9.21%
▶ 1985-2017 (Annualized)	9.68%

## Marblehead

Mary Alley Municipal Building  
7 Widger Road  
Marblehead, MA 01945  
Phone 781-639-3418  
Fax 781-631-2617

### Board Members

Robert F. Peck, Jr., Esq. (Chairperson),  
Charles Gessner, Jason R. Gilliland,  
Paul Jalbert, Alison Nieto

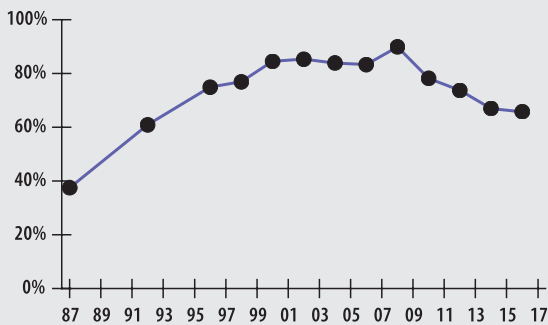
### Board Administrator

Linda Gifford

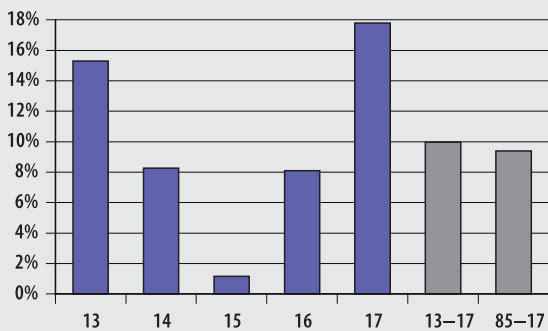
### Board Meeting

Varies

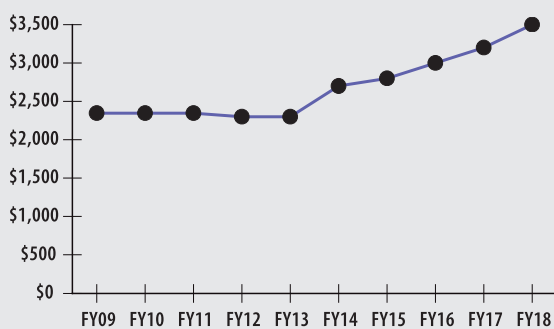
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.39%

#### 32 years 2016

9.14%

#### 31 years 2015

9.17%

#### 10 years 2017

5.65%

#### 10 years 2016

5.13%

#### 10 years 2015

5.95%

#### 5 years 2017

9.96%

#### 5 years 2016

9.22%

#### 5 years 2015

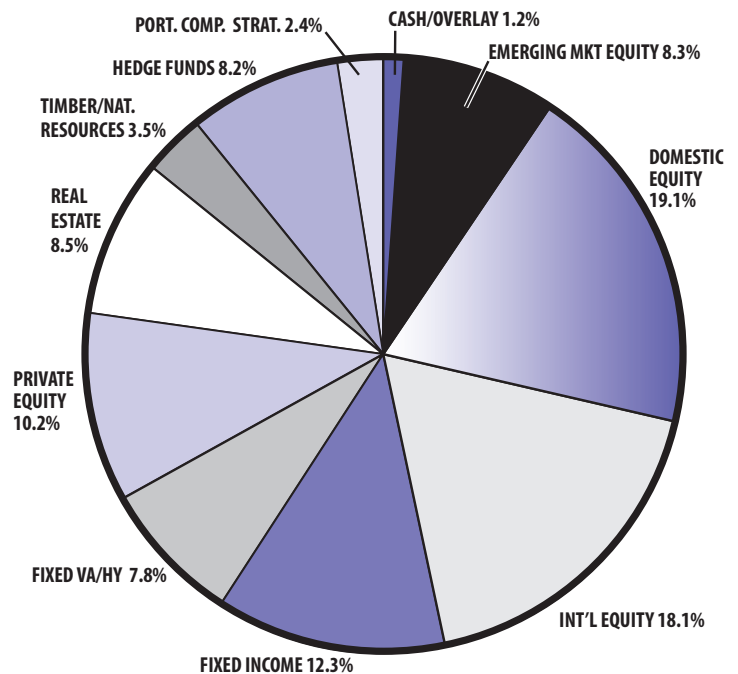
7.58%

## ACTUARIAL

▶ Funded Ratio	65.8%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	8.0% Total Increasing
▶ Year Fully Funded	2038
▶ Unfunded Liability	\$45.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$3.5 M

	ACTIVE	RETIRED
▶ Number of Members	440	345
▶ Total Payroll/Benefit	\$20.3 M	\$8.3 M
▶ Average Salary/Benefit	\$46,100	\$24,100
▶ Average Age	47	74
▶ Average Service	10.0 years	NA

## ASSET ALLOCATION (12/31/17)



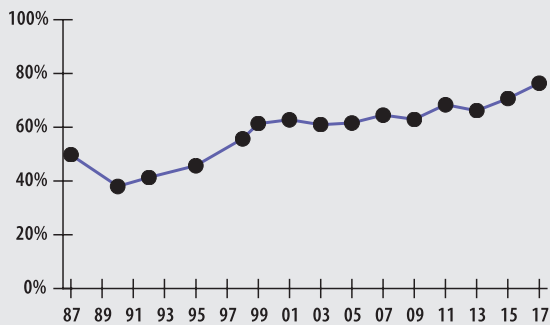
## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	21
▶ Number Who Reported Earnings	6
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

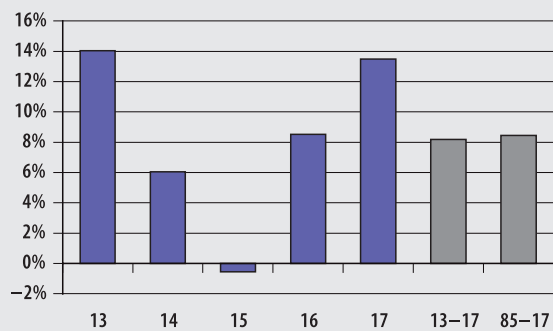
▶ 2017 Return	17.79%
▶ 2017 Market Value	\$101.4 M
▶ 2013-2017 (Annualized)	9.96%
▶ 1985-2017 (Annualized)	9.39%



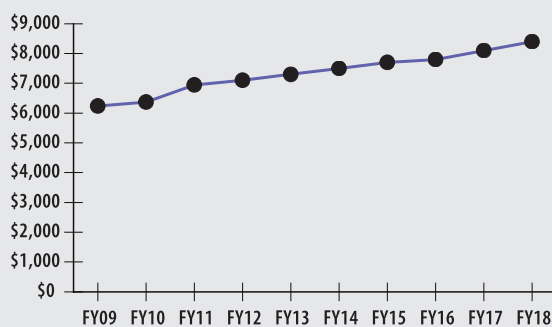
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 8.46%	<b>32 years 2016</b> 8.31%	<b>31 years 2015</b> 8.30%
<b>10 years 2017</b> 5.81%	<b>10 years 2016</b> 5.17%	<b>10 years 2015</b> 5.63%
<b>5 years 2017</b> 8.18%	<b>5 years 2016</b> 7.71%	<b>5 years 2015</b> 6.47%

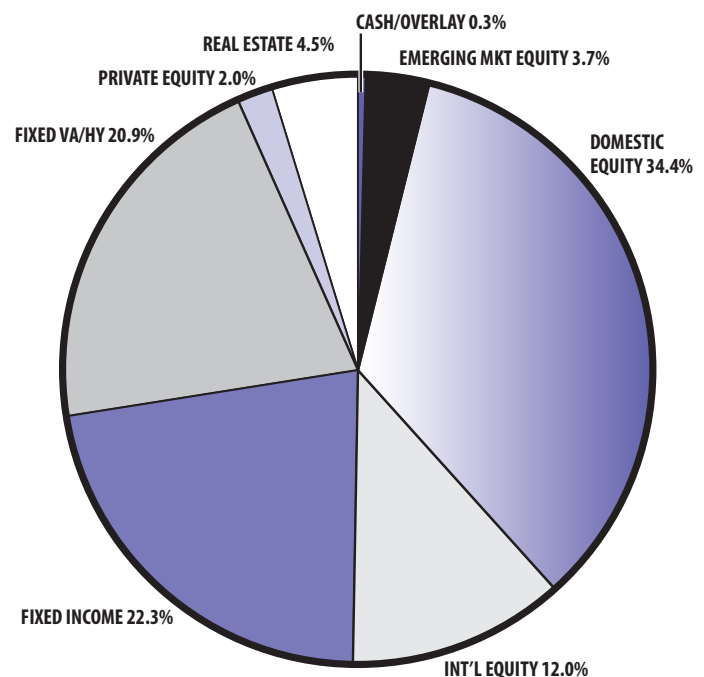
### ACTUARIAL

▶ Funded Ratio	76.4%
▶ Date of Last Valuation	01/17
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	4.5% Increasing
▶ Year Fully Funded	2025
▶ Unfunded Liability	\$47.3 M
▶ Total Pension Appropriation (Fiscal 2018)	\$8.4 M

	ACTIVE	RETIRED
▶ Number of Members	610	415
▶ Total Payroll/Benefit	\$32.6 M	\$12.1 M
▶ Average Salary/Benefit	\$53,400	\$29,100
▶ Average Age	NA	71
▶ Average Service	NA	NA

### ASSET ALLOCATION (12/31/17)

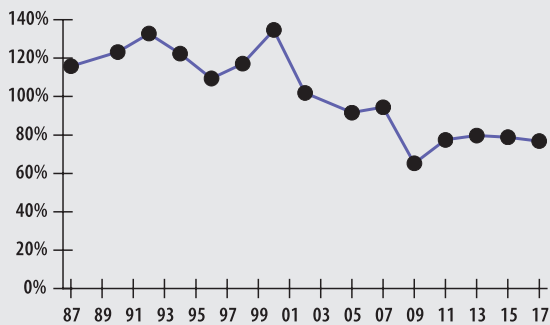


### EARNED INCOME OF DISABILITY RETIREES (2016)

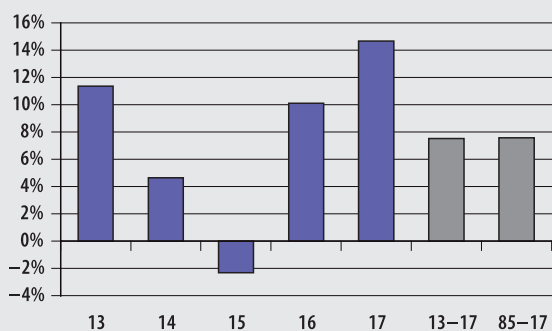
▶ Number of Disability Retirees	37
▶ Number Who Reported Earnings	8
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	13.49%
▶ 2017 Market Value	\$172.0 M
▶ 2013-2017 (Annualized)	8.18%
▶ 1985-2017 (Annualized)	8.46%

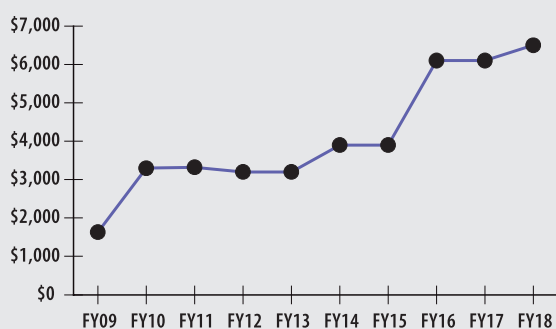
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 7.59%	<b>32 years 2016</b> 7.38%	<b>31 years 2015</b> 7.29%
<b>10 years 2017</b> 5.19%	<b>10 years 2016</b> 4.50%	<b>10 years 2015</b> 4.63%
<b>5 years 2017</b> 7.54%	<b>5 years 2016</b> 7.09%	<b>5 years 2015</b> 5.57%

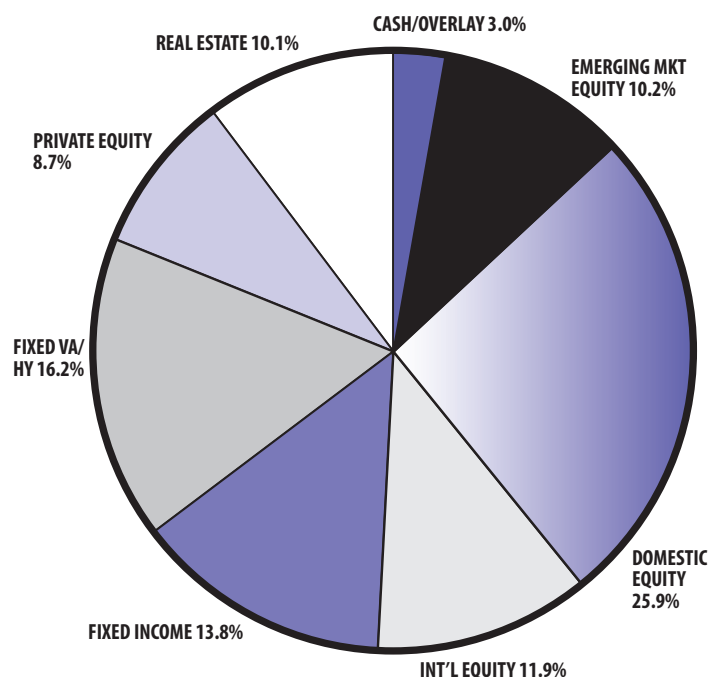
### ACTUARIAL

▶ Funded Ratio	76.8%
▶ Date of Last Valuation	01/17
▶ Actuary	Stone
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	Level
▶ Year Fully Funded	2026
▶ Unfunded Liability	\$38.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$6.5 M

	ACTIVE	RETIRED
▶ Number of Members	340	151
▶ Total Payroll/Benefit	\$32.0 M	\$9.9 M
▶ Average Salary/Benefit	\$94,200	\$65,600
▶ Average Age	50	71
▶ Average Service	14.3 years	NA

### ASSET ALLOCATION (12/31/17)



### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	2
▶ Number Who Reported Earnings	0
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	14.69%
▶ 2017 Market Value	\$149.4 M
▶ 2013-2017 (Annualized)	7.54%
▶ 1985-2017 (Annualized)	7.59%

## Massport

One Harborside Drive  
Suite 2005  
East Boston, MA 02128-2909  
Phone 617-568-3951  
Fax 617-568-3957

### Board Members

James Hoyte (Chairperson),  
Michael A. Grieco, Philip H. Mallett,  
John P. Pranckevicius, Betsy Taylor

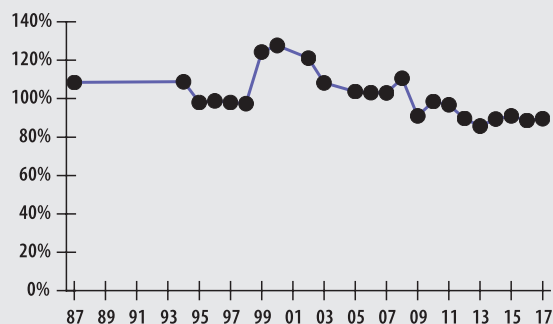
### Board Administrator

Irene E. Moran

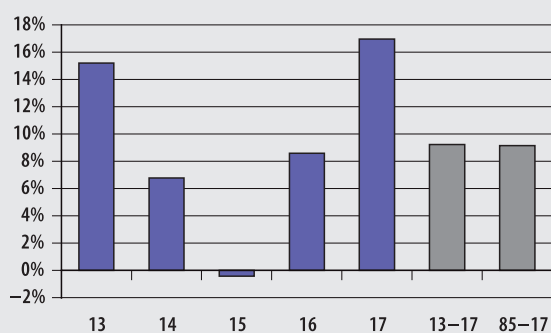
### Board Meeting

Last Thursday of the month

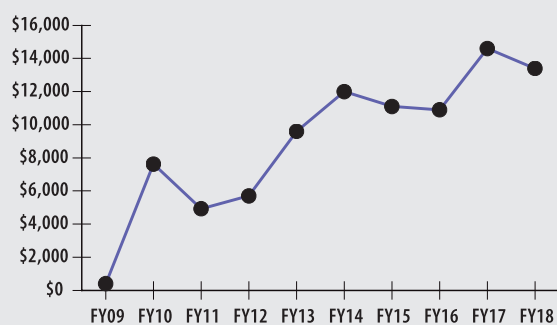
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.15%

#### 32 years 2016

8.92%

#### 31 years 2015

8.93%

#### 10 years 2017

6.13%

#### 10 years 2016

5.28%

#### 10 years 2015

5.91%

#### 5 years 2017

9.25%

#### 5 years 2016

8.54%

#### 5 years 2015

7.00%

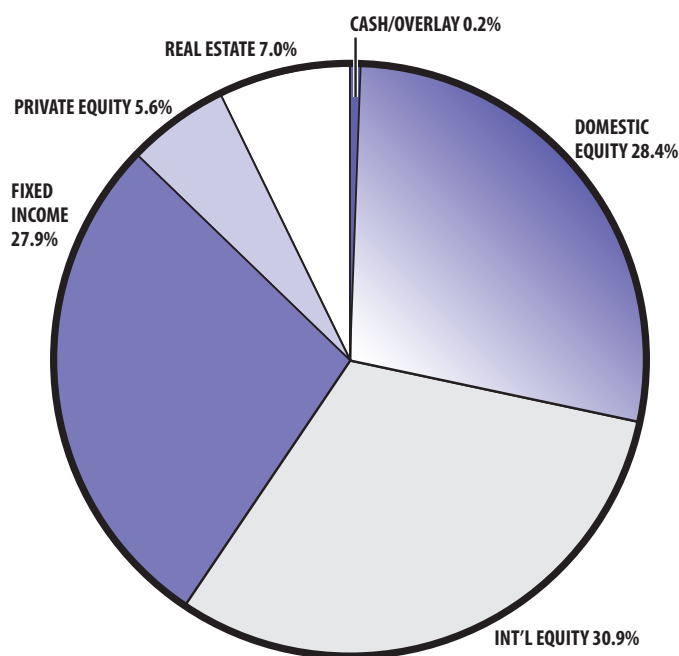
## ACTUARIAL

▶ Funded Ratio	89.6%
▶ Date of Last Valuation	01/17
▶ Actuary	Stone
▶ Assumed Rate of Return	7.25%
▶ Funding Schedule	Frozen Entry Age
▶ Year Fully Funded	NA
▶ Unfunded Liability	\$67.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$13.4 M

	ACTIVE	RETIRED
▶ Number of Members	1,268	779
▶ Total Payroll/Benefit	\$105.7 M	\$29.8 M
▶ Average Salary/Benefit	\$83,300	\$38,200
▶ Average Age	47	70
▶ Average Service	13.4 years	NA

\*by statute

## ASSET ALLOCATION (12/31/17)

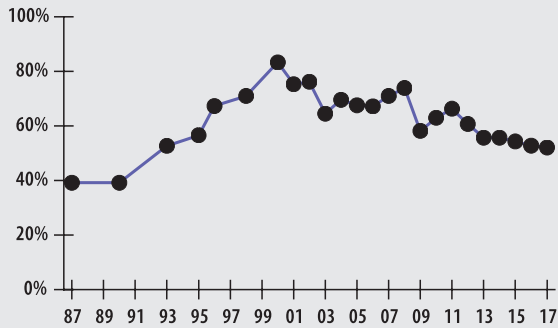


## EARNED INCOME OF DISABILITY RETIREES (2016)

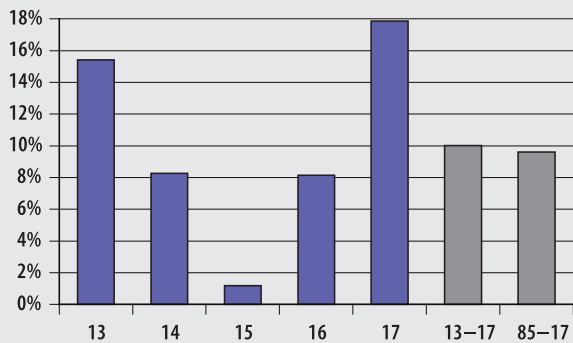
▶ Number of Disability Retirees	56
▶ Number Who Reported Earnings	14
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	16.97%
▶ 2017 Market Value	\$647.6 M
▶ 2013-2017 (Annualized)	9.25%
▶ 1985-2017 (Annualized)	9.15%

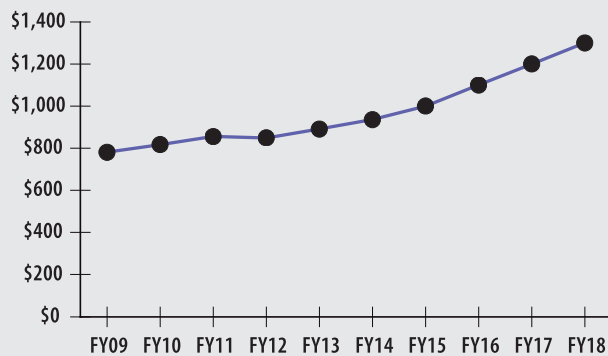
#### FUNDED RATIO (1987-2017)



#### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



#### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



#### INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 9.62%	<b>32 years 2016</b> 9.37%	<b>31 years 2015</b> 9.41%
<b>10 years 2017</b> 5.68%	<b>10 years 2016</b> 5.15%	<b>10 years 2015</b> 5.96%
<b>5 years 2017</b> 10.01%	<b>5 years 2016</b> 9.28%	<b>5 years 2015</b> 7.62%

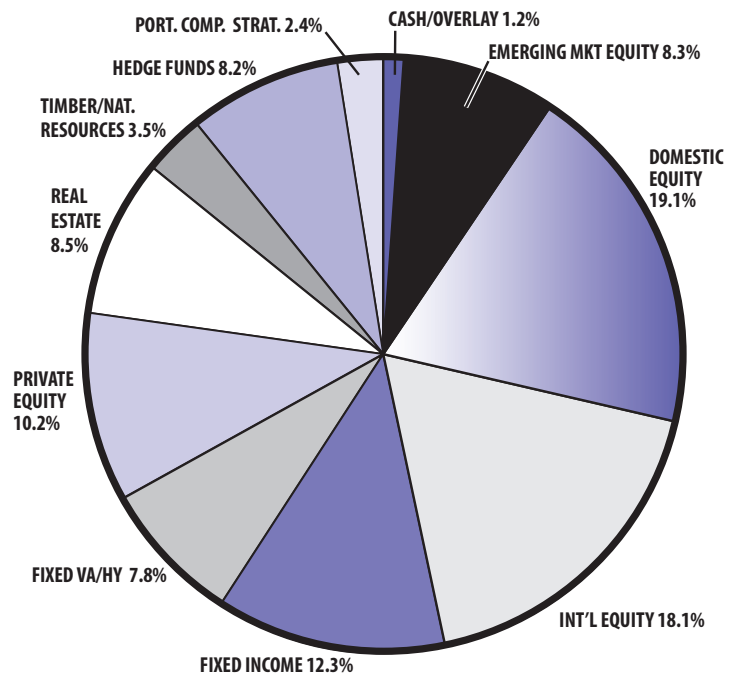
#### ACTUARIAL

▶ Funded Ratio	52.1%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	8.94% Total Increasing
▶ Year Fully Funded	2036
▶ Unfunded Liability	\$23.56 B
▶ Total Pension Appropriation (Fiscal 2018)	\$1.3 B

	ACTIVE	RETIRED
▶ Number of Members	92,128	65,036
▶ Total Payroll/Benefit	\$6.6 B	\$2.8B
▶ Average Salary/Benefit	\$71,500	\$43,600
▶ Average Age	44	72
▶ Average Service	13.0 years	NA

#### ASSET ALLOCATION (12/31/17)



#### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	719
▶ Number Who Reported Earnings	110
▶ Number of Excess Earners	1
▶ Total Amount of Refund Due	\$4,673.22

▶ 2017 Return	17.86%
▶ 2017 Market Value	\$28.60 B
▶ 2013-2017 (Annualized)	10.01%
▶ 1985-2017 (Annualized)	9.62%

**Board Members**

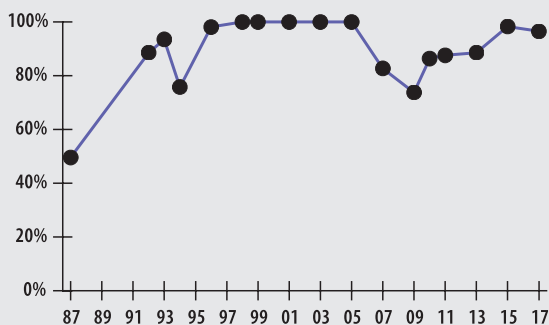
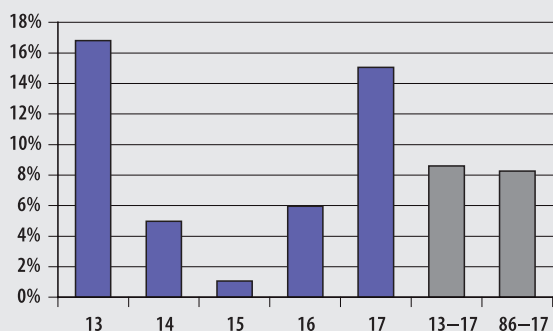
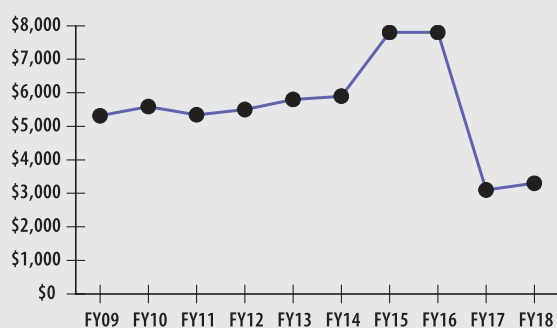
James M. Fleming, Esq. (Chairperson),  
Thomas J. Durkin, Kevin McKenna,  
Andrew Pappastergion, Frank J. Zecha

**Board Administrator**

Carolyn M. Russo

**Board Meeting**

Last Thursday of the month,  
unless otherwise posted

**FUNDED RATIO (1987-2017)**

**INVESTMENT RETURN (2013-2017, 5 YEAR AND 32 YEAR AVERAGES)**

**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**

**INVESTMENT RETURN HISTORY**
**32 years 2017**

8.27%

**31 years 2016**

8.06%

**30 years 2015**

8.13%

**10 years 2017**

6.54%

**10 years 2016**

5.92%

**10 years 2015**

6.67%

**5 years 2017**

8.60%

**5 years 2016**

8.36%

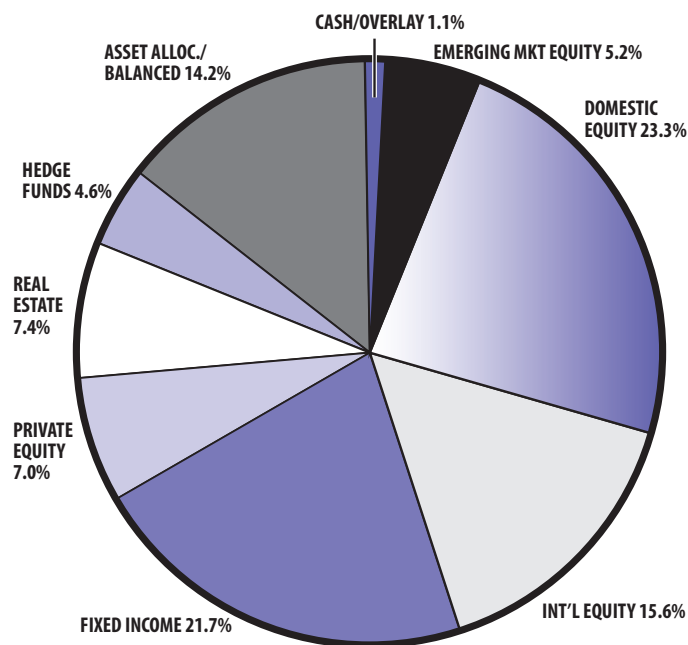
**5 years 2015**

7.41%

**ACTUARIAL**

▶ Funded Ratio	96.5%
▶ Date of Last Valuation	01/17
▶ Actuary	Segal
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	4.5% Increasing Phase-In
▶ Year Fully Funded	2024
▶ Unfunded Liability	\$18.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$3.3 M

	ACTIVE	RETIRED
▶ Number of Members	1,095	536
▶ Total Payroll/Benefit	\$89.8 M	\$18.0 M
▶ Average Salary/Benefit	\$82,000	\$33,500
▶ Average Age	52	69
▶ Average Service	18.1 years	NA

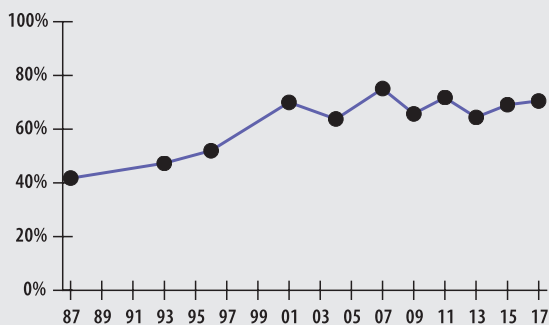
**ASSET ALLOCATION (12/31/17)**

**EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	63
▶ Number Who Reported Earnings	15
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

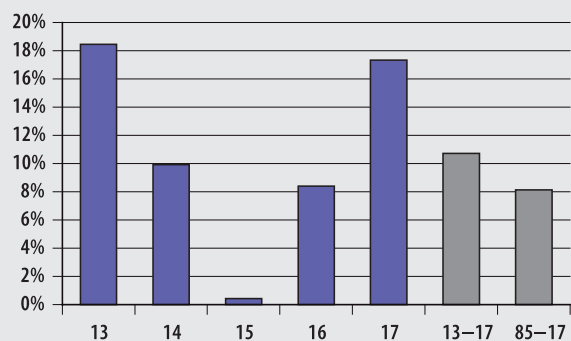
▶ 2017 Return	15.05%
▶ 2017 Market Value	\$525.4 M
▶ 2013-2017 (Annualized)	8.60%
▶ 1986-2017 (Annualized)	8.27%*

\*Based on 32-year return

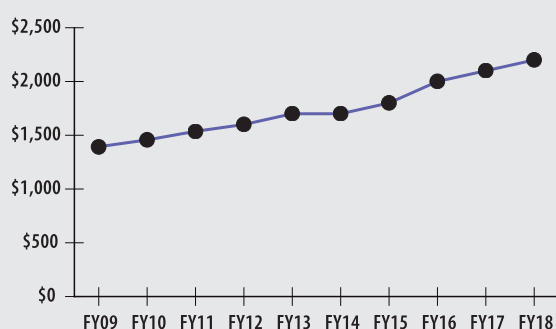
## FUNDED RATIO (1987-2017)



## INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



## 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



## INVESTMENT RETURN HISTORY

**33 years 2017**  
8.15%

**32 years 2016**  
7.87%

**31 years 2015**  
7.86%

**10 years 2017**  
6.14%

**10 years 2016**  
5.35%

**10 years 2015**  
5.31%

**5 years 2017**  
10.72%

**5 years 2016**  
9.40%

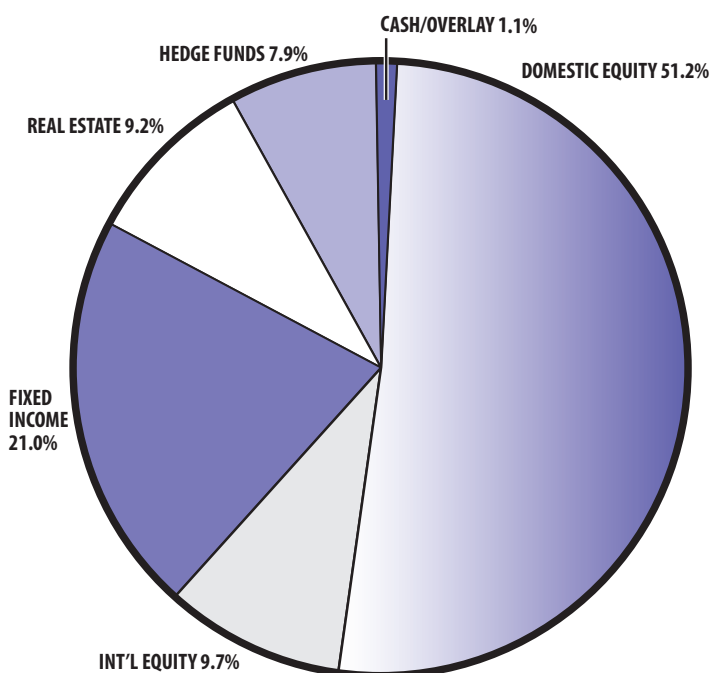
**5 years 2015**  
8.02%

## ACTUARIAL

▶ Funded Ratio	70.5%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.00%
▶ Funding Schedule	6.0% Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$16.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$2.2 M

	ACTIVE	RETIRED
▶ Number of Members	220	108
▶ Total Payroll/Benefit	\$9.8 M	\$2.9 M
▶ Average Salary/Benefit	\$44,700	\$26,600
▶ Average Age	47	75
▶ Average Service	9.9 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	7
▶ Number Who Reported Earnings	3
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.34%
▶ 2017 Market Value	\$45.8 M
▶ 2013-2017 (Annualized)	10.72%
▶ 1985-2017 (Annualized)	8.15%

## Medford

85 George P. Hassett Drive  
City Hall, Room 215  
Medford, MA 02155  
Phone 781-393-2517  
Fax 781-393-2522

### Board Members

Rick Jordan (Chairperson),  
Robert Maiocco, Aleesha Nunley,  
Patrick Ripley, James Vieira

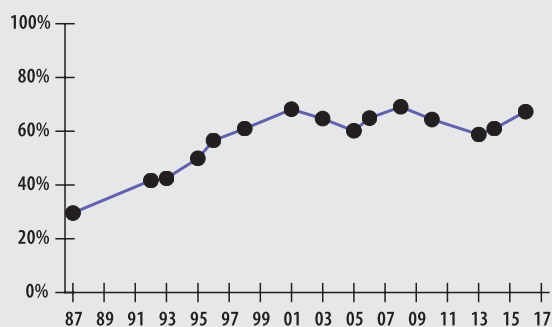
### Board Administrator

Mark Minervini

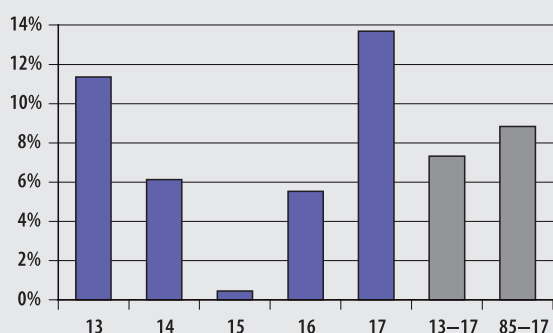
### Board Meeting

Varies

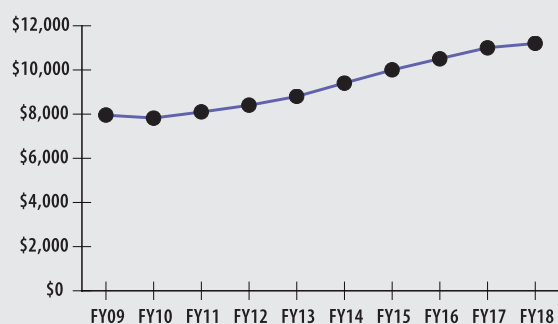
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

8.84%

#### 32 years 2016

8.69%

#### 31 years 2015

8.80%

#### 10 years 2017

5.65%

#### 10 years 2016

5.00%

#### 10 years 2015

5.74%

#### 5 years 2017

7.33%

#### 5 years 2016

7.20%

#### 5 years 2015

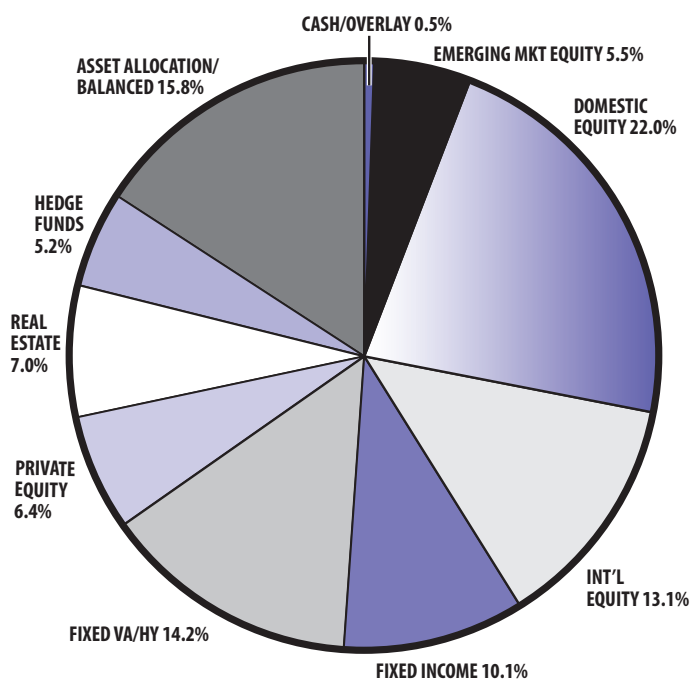
6.20%

## ACTUARIAL

▶ Funded Ratio	67.3%
▶ Date of Last Valuation	01/16
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	4.0% Increasing
▶ Year Fully Funded	2031
▶ Unfunded Liability	\$87.3 M
▶ Total Pension Appropriation (Fiscal 2018)	\$11.2 M

	ACTIVE	RETIRED
▶ Number of Members	729	583
▶ Total Payroll/Benefit	\$39.3 M	\$16.9M
▶ Average Salary/Benefit	\$53,900	\$29,000
▶ Average Age	NA	76
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	113
▶ Number Who Reported Earnings	14
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	13.69%
▶ 2017 Market Value	\$195.4 M
▶ 2013-2017 (Annualized)	7.33%
▶ 1985-2017 (Annualized)	8.84%

## Melrose

City Hall  
562 Main Street  
Melrose, MA 02176  
Phone 781-979-4151  
Fax 781-979-4206

### Board Members

Patrick D. Dello Russo (Chairperson),  
Scott Colborne, Mark Garipay,  
Michael Lindstrom, Michael L. Lyle

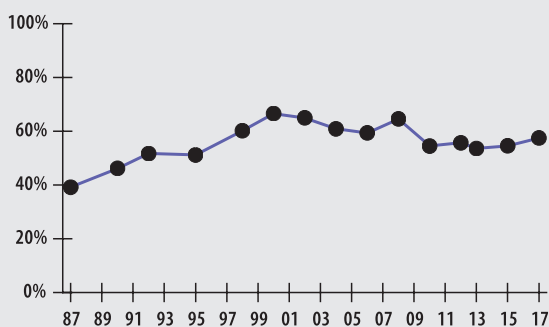
### Board Director

Adam Travinski

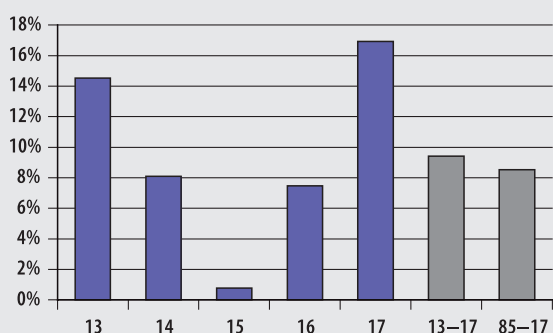
### Board Meeting

Usually the last Wednesday of each month

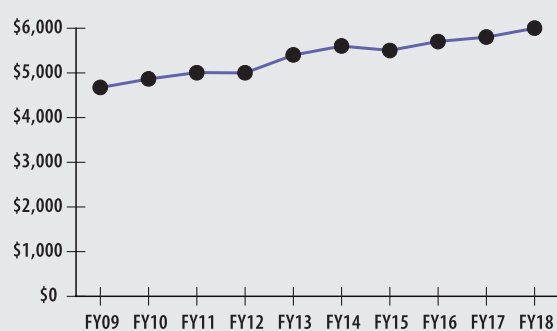
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.54%

**32 years 2016**  
8.29%

**31 years 2015**  
8.32%

**10 years 2017**  
5.34%

**10 years 2016**  
4.81%

**10 years 2015**  
5.29%

**5 years 2017**  
9.41%

**5 years 2016**  
8.66%

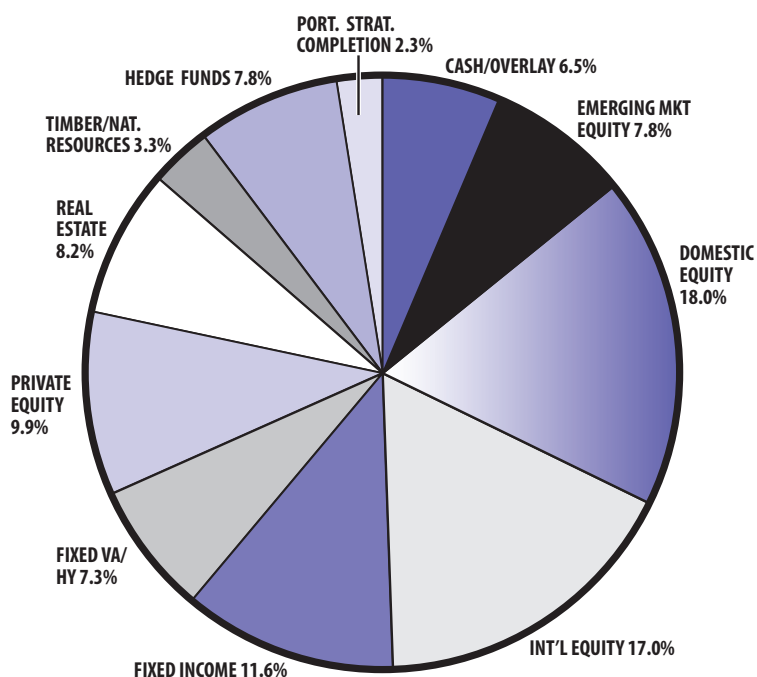
**5 years 2015**  
7.23%

## ACTUARIAL

▶ Funded Ratio	57.5%
▶ Date of Last Valuation	01/17
▶ Actuary	Stone
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	2.96% Increasing
▶ Year Fully Funded	2037
▶ Unfunded Liability	\$59.1 M
▶ Total Pension Appropriation (Fiscal 2018)	\$6.0 M

	ACTIVE	RETIRED
▶ Number of Members	428	379
▶ Total Payroll/Benefit	\$20.5 M	\$8.6 M
▶ Average Salary/Benefit	\$47,900	\$22,700
▶ Average Age	48	74
▶ Average Service	11.0 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	38
▶ Number Who Reported Earnings	8
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	16.93%
▶ 2017 Market Value	\$87.5 M
▶ 2013-2017 (Annualized)	9.41%
▶ 1985-2017 (Annualized)	8.54%



## Methuen

41 Pleasant Street  
Suite 303  
Methuen, MA 01844  
Phone 978-983-8620  
Fax 978-983-8972

### Board Members

Michael Hennessy (Chairperson),  
Louise Moss, Robert Sheehan,  
John T. Sheehy, Albert J. Trott, III

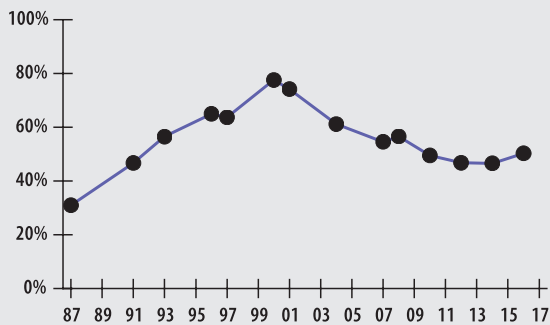
### Board Administrator

Kaitlyn Doucette

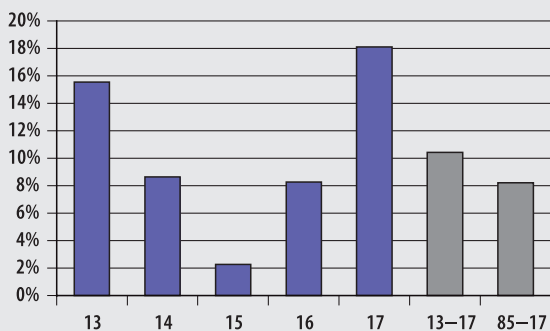
### Board Meeting

Last Thursday of each month at 9:30 am

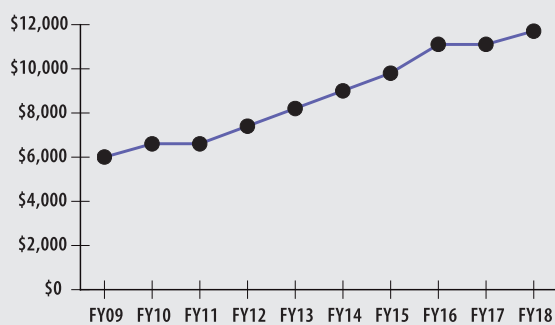
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

8.22%

#### 32 years 2016

7.92%

#### 31 years 2015

7.91%

#### 10 years 2017

6.02%

#### 10 years 2016

4.97%

#### 10 years 2015

5.30%

#### 5 years 2017

10.43%

#### 5 years 2016

9.60%

#### 5 years 2015

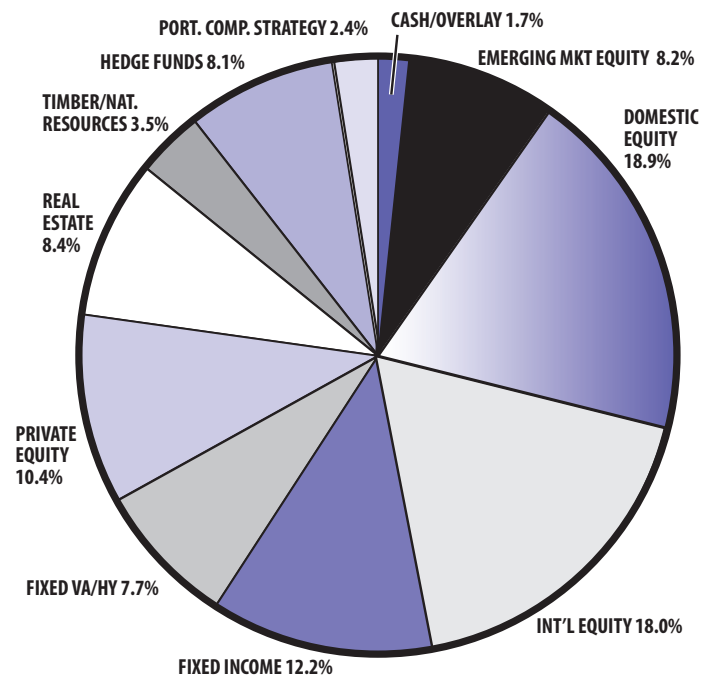
8.22%

## ACTUARIAL

▶ Funded Ratio	50.3%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	5.0% Total Increasing
▶ Year Fully Funded	2034
▶ Unfunded Liability	\$118.5 M
▶ Total Pension Appropriation (Fiscal 2018)	\$11.7 M

	ACTIVE	RETIRED
▶ Number of Members	642	415
▶ Total Payroll/Benefit	\$34.5 M	\$11.7 M
▶ Average Salary/Benefit	\$53,700	\$28,300
▶ Average Age	47	72
▶ Average Service	14.3 years	NA

## ASSET ALLOCATION (12/31/17)

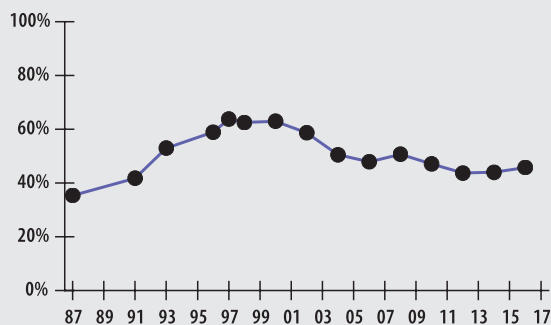


## EARNED INCOME OF DISABILITY RETIREES (2016)

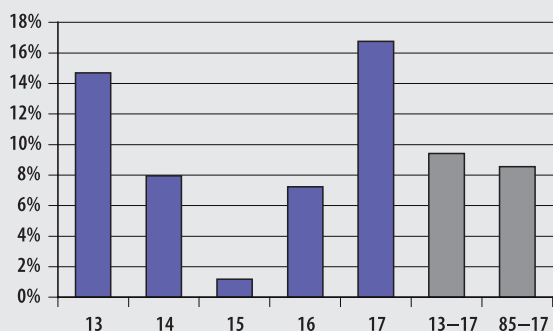
▶ Number of Disability Retirees	56
▶ Number Who Reported Earnings	12
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	18.11%
▶ 2017 Market Value	\$152.1 M
▶ 2013-2017 (Annualized)	10.43%
▶ 1985-2017 (Annualized)	8.22%

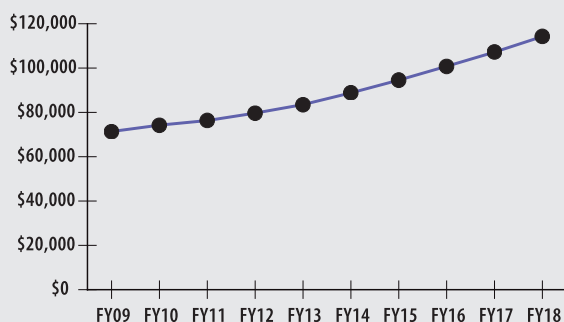
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

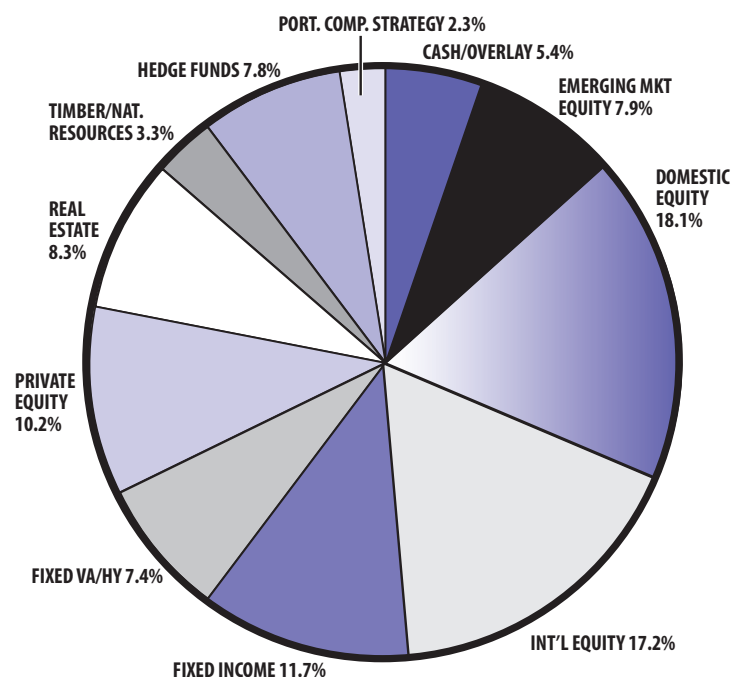
<b>33 years 2017</b> 8.55%	<b>32 years 2016</b> 8.30%	<b>31 years 2015</b> 8.34%
<b>10 years 2017</b> 5.61%	<b>10 years 2016</b> 5.05%	<b>10 years 2015</b> 5.64%
<b>5 years 2017</b> 9.42%	<b>5 years 2016</b> 8.79%	<b>5 years 2015</b> 7.49%

## ACTUARIAL

▶ Funded Ratio	45.8%
▶ Date of Last Valuation	01/16
▶ Actuary	Segal
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.0% Increasing Phase-In
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$1.35 B
▶ Total Pension Appropriation (Fiscal 2018)	\$114.2 M

	ACTIVE	RETIRED
▶ Number of Members	9,072	5,327
▶ Total Payroll/Benefit	\$447.3 M	\$130.0 M
▶ Average Salary/Benefit	\$49,300	\$24,400
▶ Average Age	48	NA
▶ Average Service	11.6 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	444
▶ Number Who Reported Earnings	111
▶ Number of Excess Earners	3
▶ Total Amount of Refund Due	\$22,447.35

▶ 2017 Return	16.76%
▶ 2017 Market Value	\$1.4 B
▶ 2013-2017 (Annualized)	9.42%
▶ 1985-2017 (Annualized)	8.55%

## Milford

Town Hall, Room 17  
52 Main Street  
Milford, MA 01757  
Phone 508-634-2321  
Fax 508-634-0902

### Board Members

Zachary A. Taylor (Chairperson),  
Linda P. DeDominick, Michael A. Diorio, C.P.A.  
Gerald Hennessy, Ernest Pettinari, Esq.

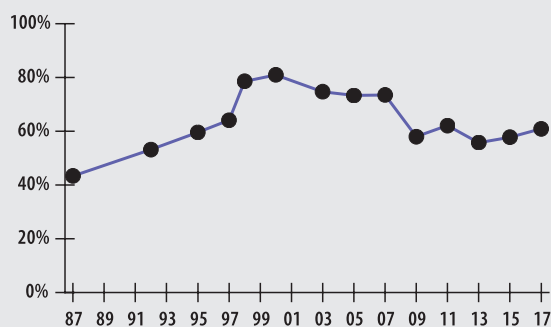
### Board Administrator

Alberta J. Farley

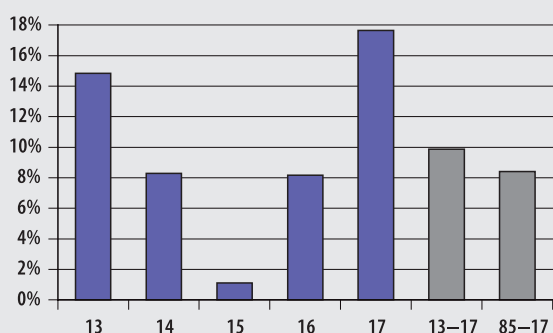
### Board Meeting

Third Tuesday of each month at 1:00 pm

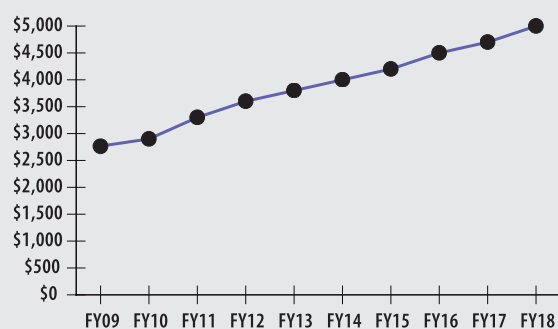
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.40%

**32 years 2016**  
8.13%

**31 years 2015**  
8.13%

**10 years 2017**  
5.09%

**10 years 2016**  
4.28%

**10 years 2015**  
4.43%

**5 years 2017**  
9.87%

**5 years 2016**  
9.07%

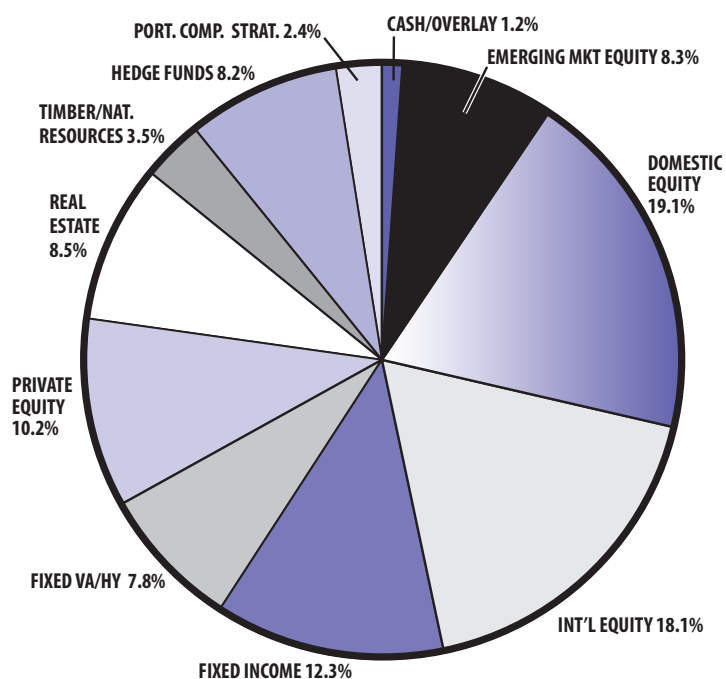
**5 years 2015**  
7.41%

## ACTUARIAL

▶ Funded Ratio	60.9%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.40%
▶ Funding Schedule	6.5% Total Increasing
▶ Year Fully Funded	2036
▶ Unfunded Liability	\$53.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$5.0 M

	ACTIVE	RETIRED
▶ Number of Members	486	297
▶ Total Payroll/Benefit	\$21.1 M	\$7.1 M
▶ Average Salary/Benefit	\$43,500	\$23,800
▶ Average Age	48	74
▶ Average Service	11.9 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	32
▶ Number Who Reported Earnings	8
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.65%
▶ 2017 Market Value	\$95.1 M
▶ 2013-2017 (Annualized)	9.87%
▶ 1985-2017 (Annualized)	8.40%

## Milton

40 Willard Street, Suite G102  
Quincy, MA 02169  
Phone 617-770-5970  
Fax 617-770-5971

### Board Members

Paige A. Eppolito (Chairperson),  
Thomas Cicerone, Amy Dexter,  
Richard J. Madigan, William H. Murphy, Jr.

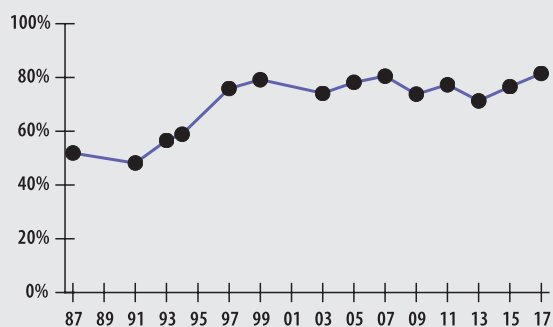
### Board Administrator

Jeanne Darcy

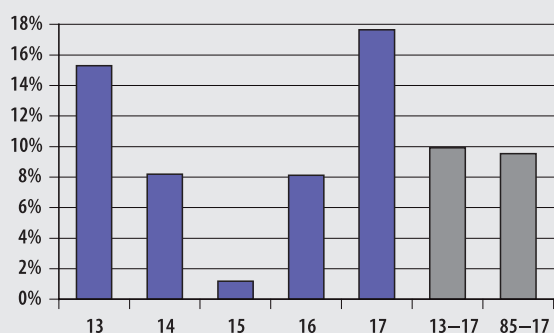
### Board Meeting

Last Thursday of each month at 3:30 pm

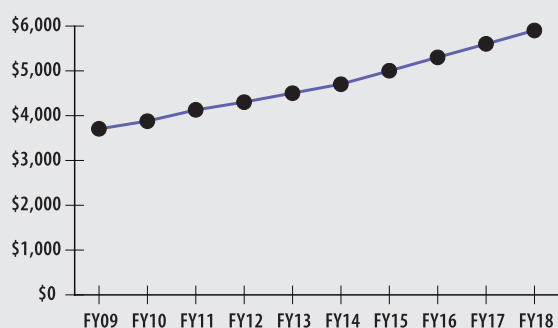
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.53%

#### 32 years 2016

9.29%

#### 31 years 2015

9.33%

#### 10 years 2017

5.67%

#### 10 years 2016

5.12%

#### 10 years 2015

5.82%

#### 5 years 2017

9.93%

#### 5 years 2016

9.22%

#### 5 years 2015

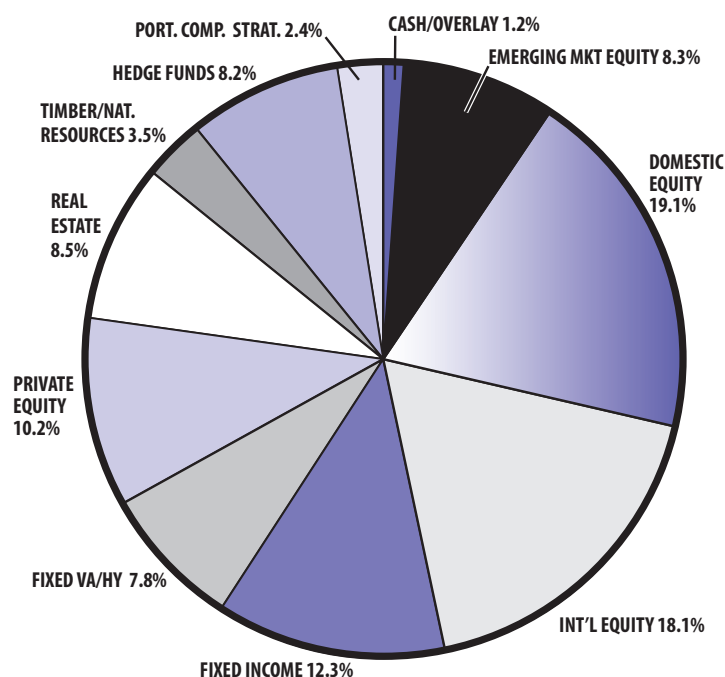
7.58%

## ACTUARIAL

▶ Funded Ratio	81.5%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	6.0% Total Increasing
▶ Year Fully Funded	2025
▶ Unfunded Liability	\$27.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$5.9 M

	ACTIVE	RETIRED
▶ Number of Members	377	273
▶ Total Payroll/Benefit	\$21.6 M	\$8.3 M
▶ Average Salary/Benefit	\$57,200	\$30,300
▶ Average Age	47	75
▶ Average Service	12.3 years	NA

## ASSET ALLOCATION (12/31/17)

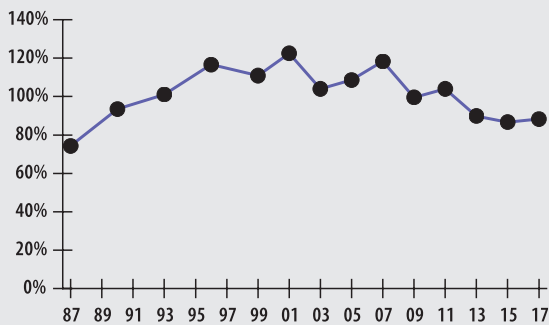


## EARNED INCOME OF DISABILITY RETIREES (2016)

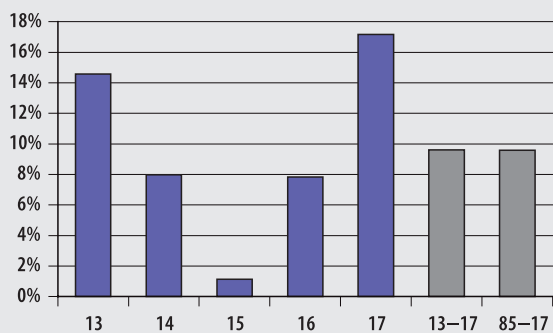
▶ Number of Disability Retirees	36
▶ Number Who Reported Earnings	9
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.65%
▶ 2017 Market Value	\$135.1 M
▶ 2013-2017 (Annualized)	9.93%
▶ 1985-2017 (Annualized)	9.53%

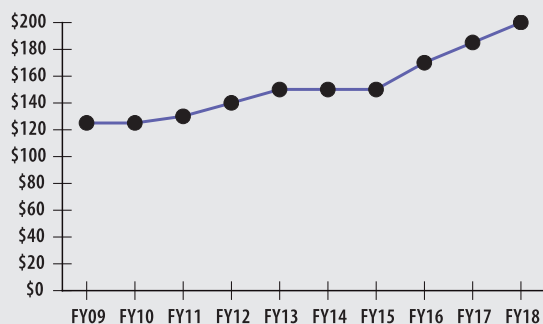
#### FUNDED RATIO (1987-2017)



#### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



#### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



#### INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 9.59%	<b>32 years 2016</b> 9.37%	<b>31 years 2015</b> 9.42%
<b>10 years 2017</b> 5.41%	<b>10 years 2016</b> 4.95%	<b>10 years 2015</b> 5.80%
<b>5 years 2017</b> 9.60%	<b>5 years 2016</b> 8.87%	<b>5 years 2015</b> 7.31%

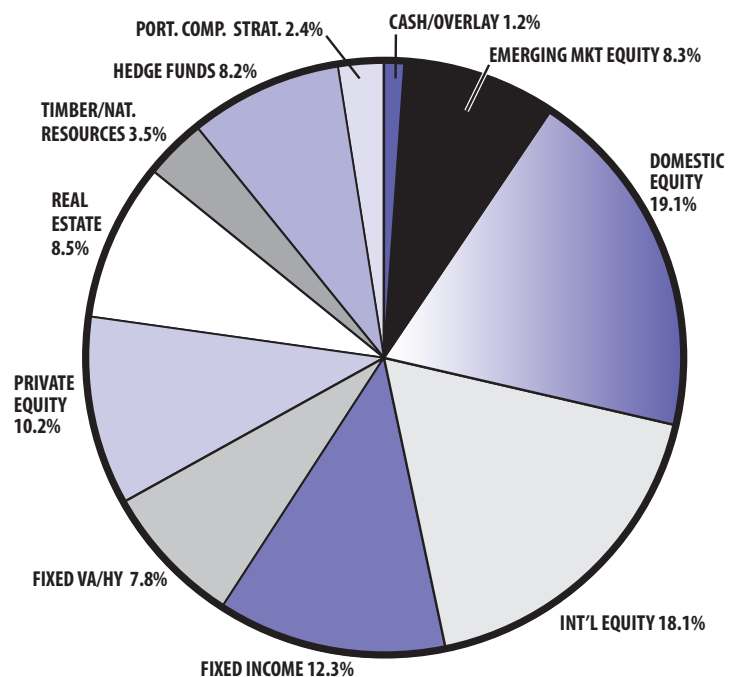
#### ACTUARIAL

▶ Funded Ratio	88.3%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.40%
▶ Funding Schedule	8.0% Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$1.8 M
▶ Total Pension Appropriation (Fiscal 2018)	\$200,000

	ACTIVE	RETIRED
▶ Number of Members	47	42
▶ Total Payroll/Benefit	\$2.2 M	\$1.0 M
▶ Average Salary/Benefit	\$47,000	\$24,900
▶ Average Age	48	74
▶ Average Service	8.6 years	NA

#### ASSET ALLOCATION (12/31/17)



#### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	2
▶ Number Who Reported Earnings	0
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.16%
▶ 2017 Market Value	\$14.3 M
▶ 2013-2017 (Annualized)	9.60%
▶ 1985-2017 (Annualized)	9.59%

## Montague

One Avenue A  
Turners Falls, MA 01376  
Phone 413-863-3200, Ext. 111  
Fax 413-863-3224

### Board Members

David R. Dion (Chairperson),  
Cheryl Clark, Steven Ellis,  
Marianne Fiske, Carolyn S. Olsen

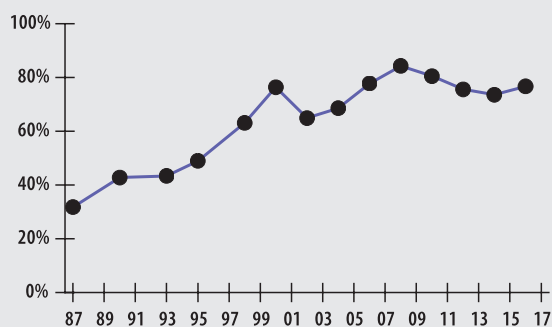
### Board Administrator

Debra Underhill

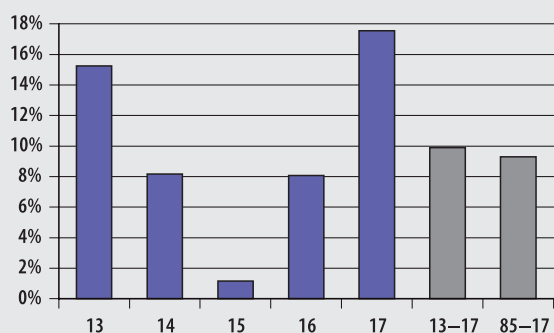
### Board Meeting

Usually the fourth Tuesday of each month at 1:00 pm

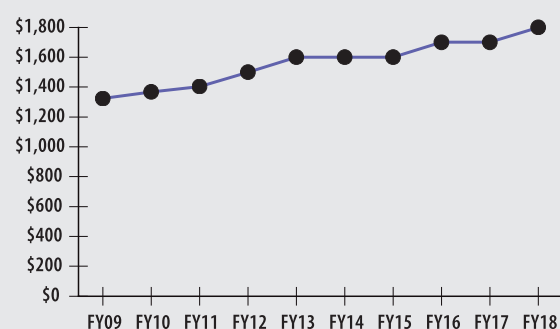
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
9.29%

**32 years 2016**  
9.04%

**31 years 2015**  
9.07%

**10 years 2017**  
5.59%

**10 years 2016**  
5.09%

**10 years 2015**  
5.91%

**5 years 2017**  
9.89%

**5 years 2016**  
9.20%

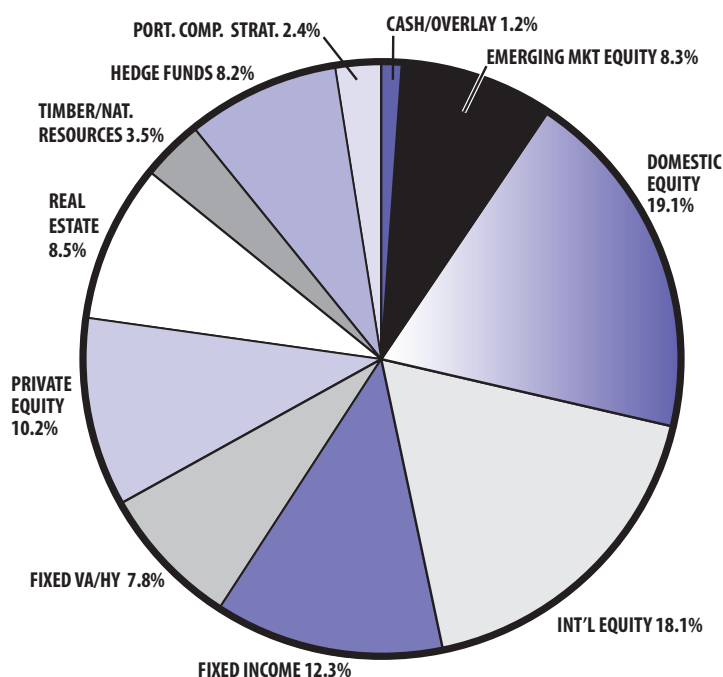
**5 years 2015**  
7.56%

## ACTUARIAL

▶ Funded Ratio	76.7%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	3.9% Total Increasing
▶ Year Fully Funded	2030
▶ Unfunded Liability	\$10.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$1.8 M

	ACTIVE	RETIRED
▶ Number of Members	198	119
▶ Total Payroll/Benefit	\$7.0 M	\$2.3 M
▶ Average Salary/Benefit	\$35,100	\$19,100
▶ Average Age	49	72
▶ Average Service	11.7 years	NA

## ASSET ALLOCATION (12/31/17)

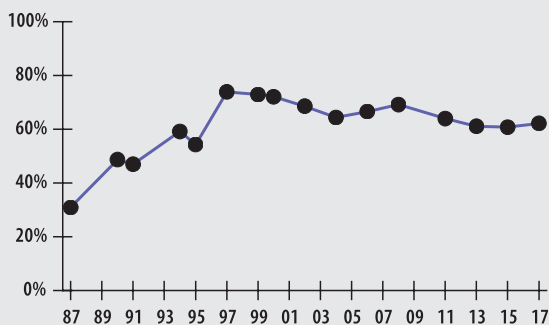


## EARNED INCOME OF DISABILITY RETIREES (2016)

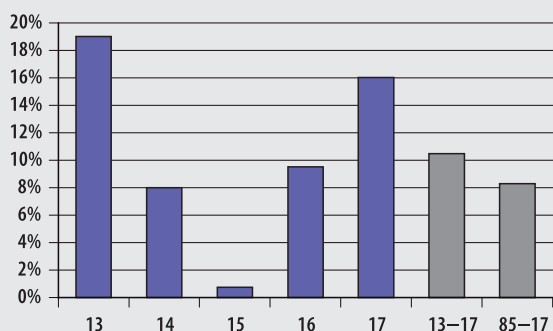
▶ Number of Disability Retirees	14
▶ Number Who Reported Earnings	2
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.55%
▶ 2017 Market Value	\$42.8 M
▶ 2013-2017 (Annualized)	9.89%
▶ 1985-2017 (Annualized)	9.29%

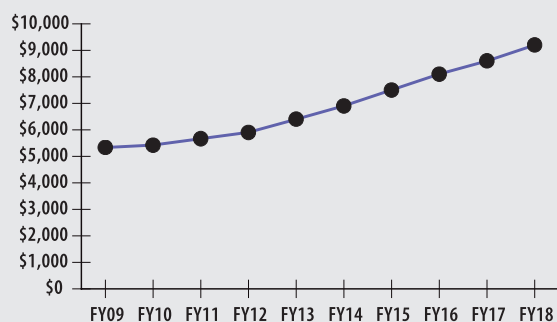
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

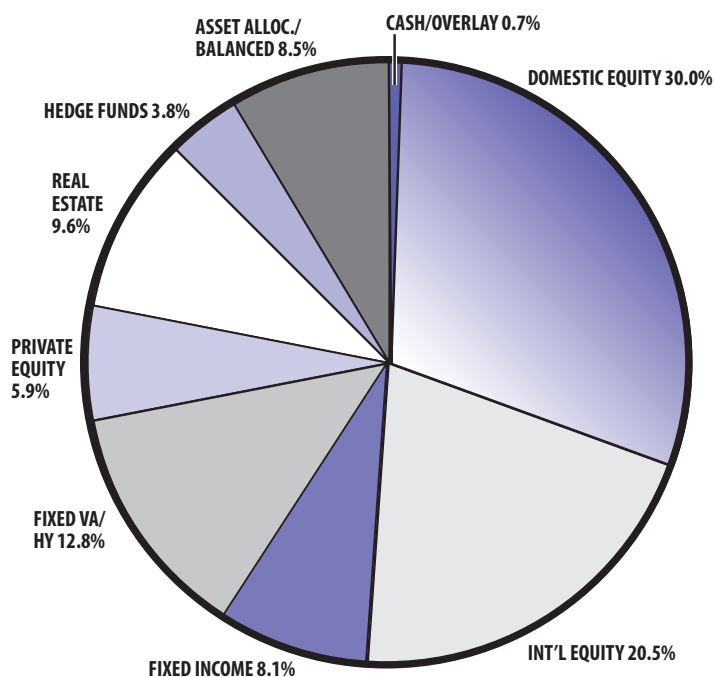
<b>33 years 2017</b> 8.30%	<b>32 years 2016</b> 8.07%	<b>31 years 2015</b> 8.02%
<b>10 years 2017</b> 5.70%	<b>10 years 2016</b> 5.06%	<b>10 years 2015</b> 5.26%
<b>5 years 2017</b> 10.48%	<b>5 years 2016</b> 10.16%	<b>5 years 2015</b> 8.23%

## ACTUARIAL

▶ Funded Ratio	62.2%
▶ Date of Last Valuation	01/17
▶ Actuary	Segal
▶ Assumed Rate of Return	7.38%
▶ Funding Schedule	4.0% Increasing Phase-In
▶ Year Fully Funded	2030
▶ Unfunded Liability	\$80.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$9.2 M

	ACTIVE	RETIRED
▶ Number of Members	644	397
▶ Total Payroll/Benefit	\$37.4 M	\$10.9 M
▶ Average Salary/Benefit	\$58,100	\$27,500
▶ Average Age	47	NA
▶ Average Service	11.5 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	20
▶ Number Who Reported Earnings	5
▶ Number of Excess Earners	1
▶ Total Amount of Refund Due	\$937.87

▶ 2017 Return	16.03%
▶ 2017 Market Value	\$143.5 M
▶ 2013-2017 (Annualized)	10.48%
▶ 1985-2017 (Annualized)	8.30%

## Needham

Town Hall  
1471 Highland Avenue  
Needham, MA 02492-2605  
Phone 781-455-7500, Ext. 231  
Fax 781-449-4569

### Board Members

Evelyn M. Poness (Chairperson),  
Sandra J. Cincotta, John P. Krawiecki,  
Robert P. Mearls, Thomas A. Welch II

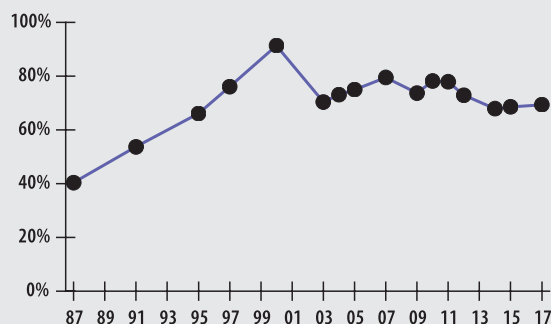
### Board Administrator

Juanita Hearn

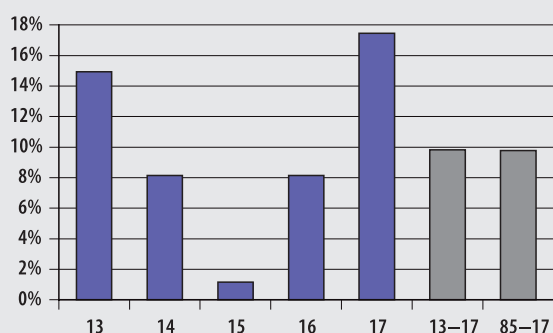
### Board Meeting

Usually second Wednesday of each  
month at 9:00 am

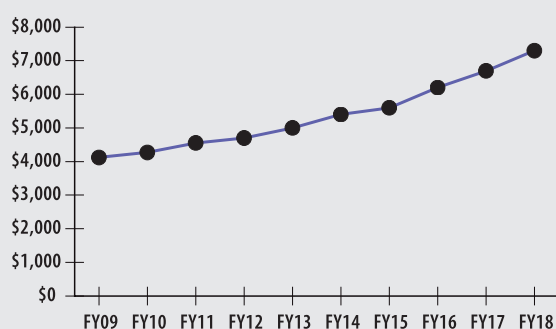
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
9.79%

**32 years 2016**  
9.55%

**31 years 2015**  
9.60%

**10 years 2017**  
5.54%

**10 years 2016**  
5.04%

**10 years 2015**  
5.85%

**5 years 2017**  
9.82%

**5 years 2016**  
9.11%

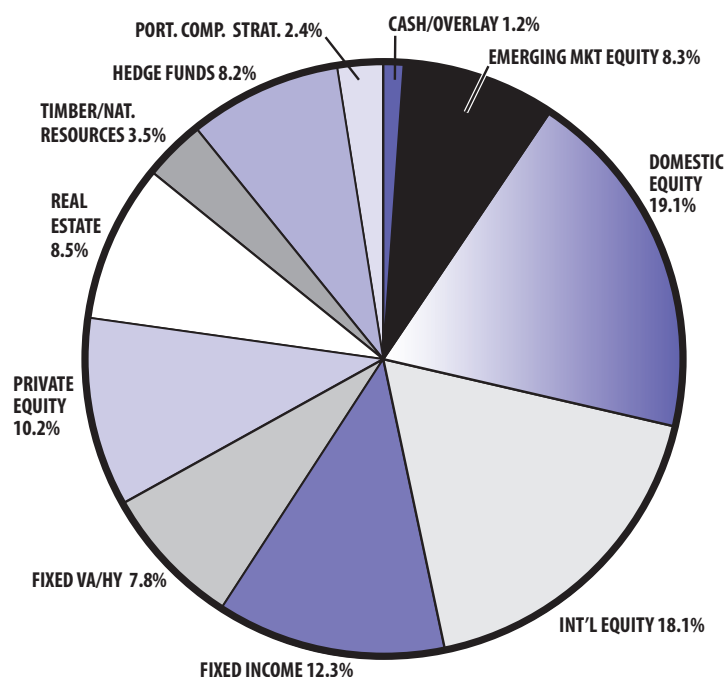
**5 years 2015**  
7.45%

## ACTUARIAL

▶ Funded Ratio	69.4%
▶ Date of Last Valuation	01/17
▶ Actuary	Segal
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	4.5% Increasing Phase-In
▶ Year Fully Funded	2030
▶ Unfunded Liability	\$65.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$7.3 M

	ACTIVE	RETIRED
▶ Number of Members	650	463
▶ Total Payroll/Benefit	\$34.9 M	\$11.9 M
▶ Average Salary/Benefit	\$53,700	\$25,700
▶ Average Age	48	76
▶ Average Service	11.3 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	36
▶ Number Who Reported Earnings	6
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.47%
▶ 2017 Market Value	\$164.2 M
▶ 2013-2017 (Annualized)	9.82%
▶ 1985-2017 (Annualized)	9.79%



## New Bedford

651 Orchard Street, #203A  
New Bedford, MA 02744  
Phone 508-979-1538  
Fax 508-979-1799

### Board Members

James Allen (Chairperson),  
Leonard F. Baillargeon, Robert Ekstrom,  
Angela Natho, Susan M. Thompson

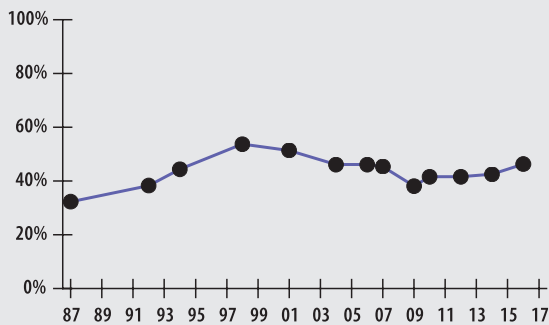
### Board Administrator

Gerard Arnaudet

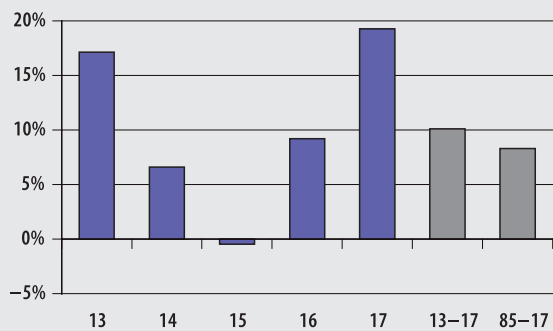
### Board Meeting

Usually last Thursday of each  
month at 9:00 am

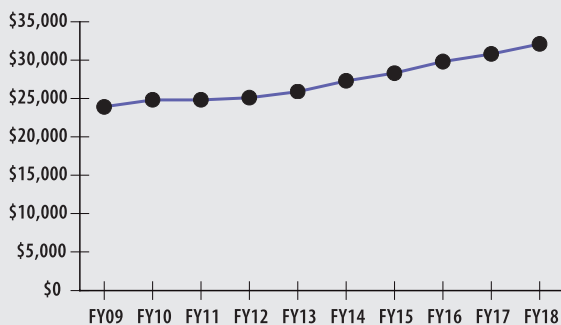
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.30%

**32 years 2016**  
7.98%

**31 years 2015**  
7.94%

**10 years 2017**  
6.12%

**10 years 2016**  
5.30%

**10 years 2015**  
5.75%

**5 years 2017**  
10.13%

**5 years 2016**  
9.28%

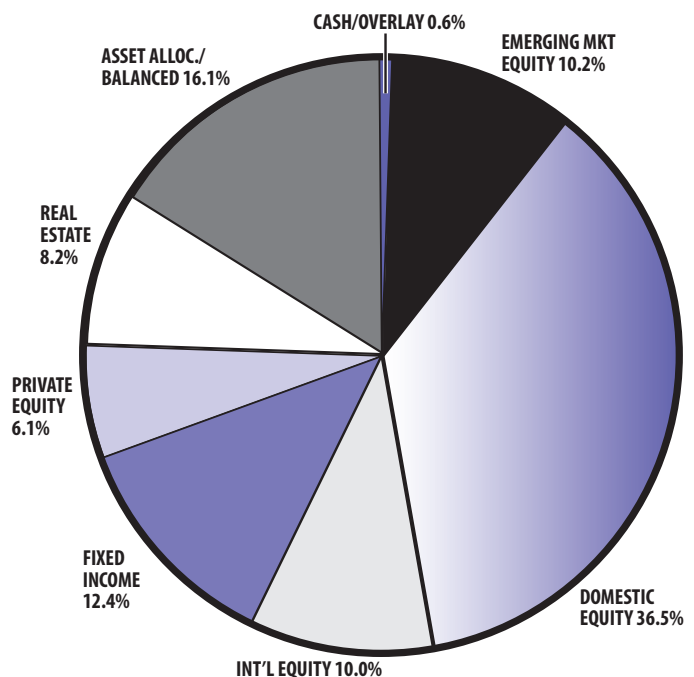
**5 years 2015**  
6.89%

## ACTUARIAL

▶ Funded Ratio	46.3%
▶ Date of Last Valuation	01/16
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	3.5% Increasing
▶ Year Fully Funded	2034
▶ Unfunded Liability	\$332.3 M
▶ Total Pension Appropriation (Fiscal 2018)	\$32.1 M

	ACTIVE	RETIRED
▶ Number of Members	1,961	1,843
▶ Total Payroll/Benefit	\$89.6 M	\$43.4 M
▶ Average Salary/Benefit	\$45,700	\$23,500
▶ Average Age	NA	74
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	326
▶ Number Who Reported Earnings	78
▶ Number of Excess Earners	2
▶ Total Amount of Refund Due	\$56,804.86

▶ 2017 Return	19.29%
▶ 2017 Market Value	\$334.4 M
▶ 2013-2017 (Annualized)	10.13%
▶ 1985-2017 (Annualized)	8.30%

## Newburyport

16 Unicorn Street  
Newburyport, MA 01950  
Phone 978-465-6619  
Fax 978-462-4042

### Board Members

Joseph Spaulding (Chairperson),  
Jeffrey R. Cutter, Alexander Kravchuk,  
John Moak, Ethan R. Manning

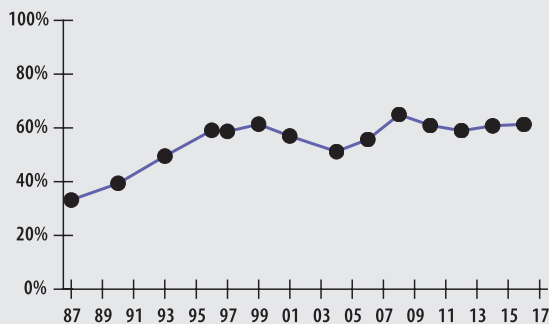
### Board Administrator

Laurie Burton

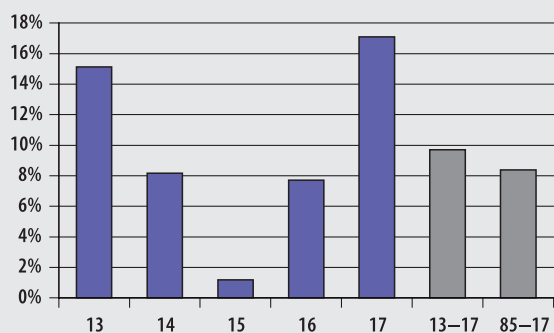
### Board Meeting

Varies

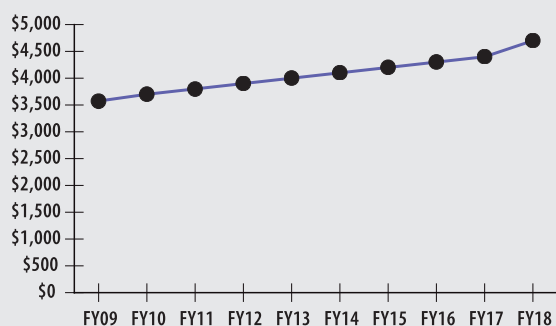
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.39%

**32 years 2016**  
8.13%

**31 years 2015**  
8.15%

**10 years 2017**  
5.50%

**10 years 2016**  
5.02%

**10 years 2015**  
5.85%

**5 years 2017**  
9.71%

**5 years 2016**  
9.07%

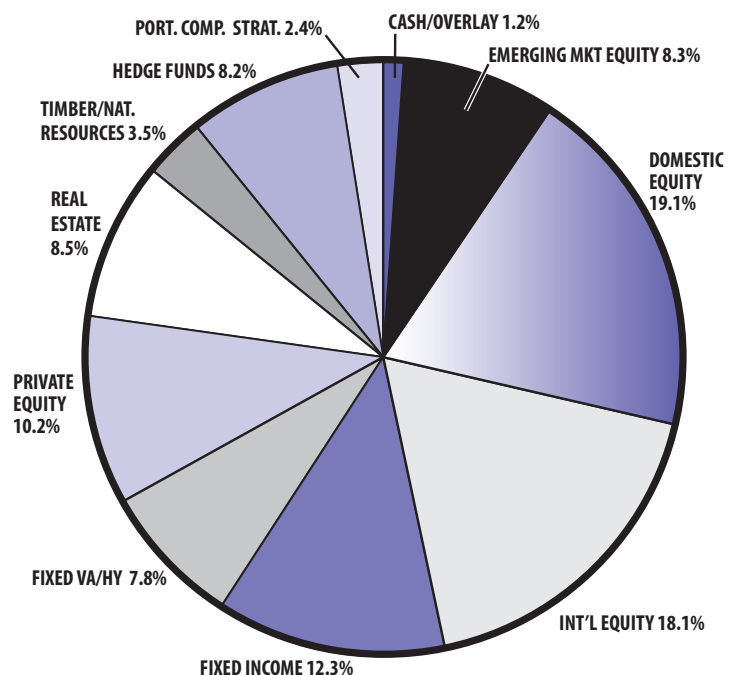
**5 years 2015**  
7.49%

## ACTUARIAL

▶ Funded Ratio	61.3%
▶ Date of Last Valuation	1/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	5.0% Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$43.3 M
▶ Total Pension Appropriation (Fiscal 2018)	\$4.7 M

	ACTIVE	RETIRED
▶ Number of Members	353	220
▶ Total Payroll/Benefit	\$17.5 M	\$5.9 M
▶ Average Salary/Benefit	\$49,500	\$26,900
▶ Average Age	49	72
▶ Average Service	12.0 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	28
▶ Number Who Reported Earnings	8
▶ Number of Excess Earners	1
▶ Total Amount of Refund Due	\$21,159.96

▶ 2017 Return	17.11%
▶ 2017 Market Value	\$82.3 M
▶ 2013-2017 (Annualized)	9.71%
▶ 1985-2017 (Annualized)	8.39%

## Newton

City Hall  
1000 Commonwealth Avenue  
Newton Centre, MA 02459-1449  
Phone 617-796-1095  
Fax 617-796-1098

### Board Members

Kimberly A. Fletcher, Esq. (Chairperson),  
Paul Bianchi, Susan Dzikowski,  
Thomas Lopez, Nunzio Piselli

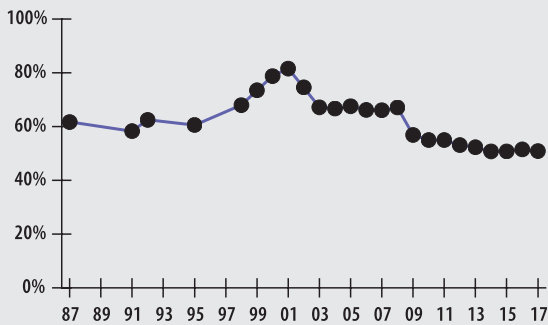
### Board Administrator

Kelly Byrne

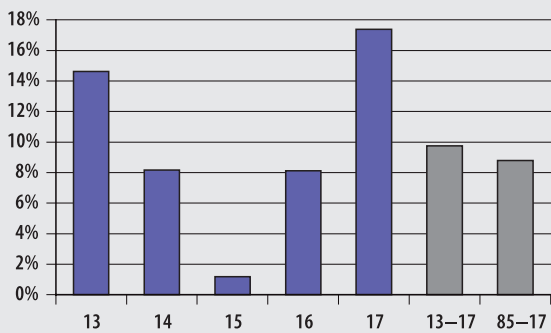
### Board Meeting

Third Wednesday of the month at 3:00 pm

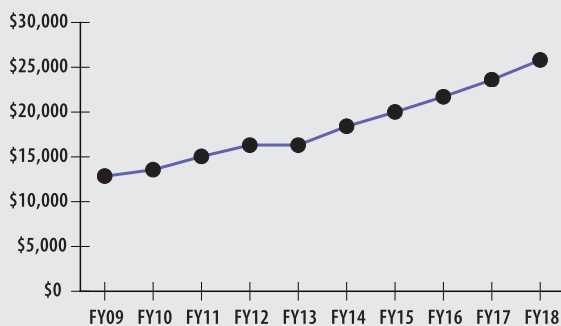
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.79%

**32 years 2016**  
8.53%

**31 years 2015**  
8.55%

**10 years 2017**  
5.61%

**10 years 2016**  
5.01%

**10 years 2015**  
5.44%

**5 years 2017**  
9.75%

**5 years 2016**  
9.14%

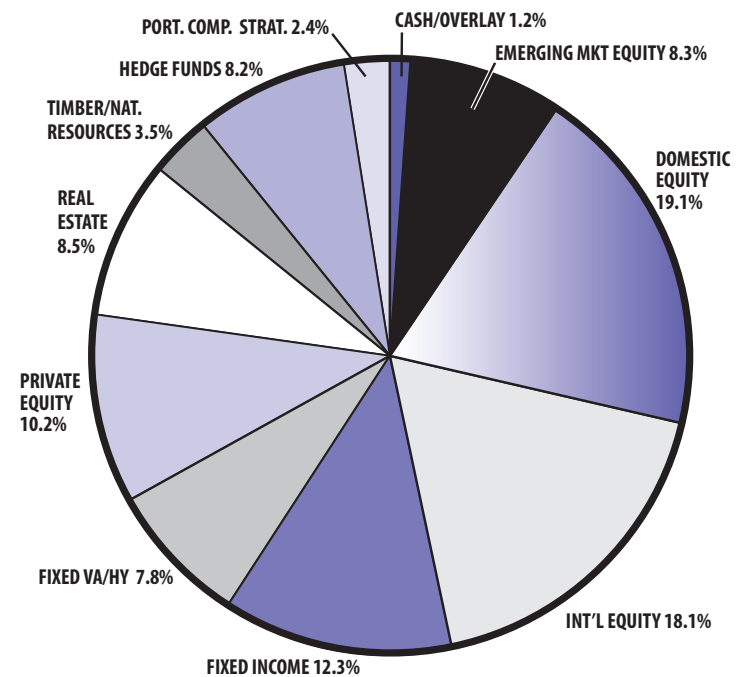
**5 years 2015**  
7.57%

## ACTUARIAL

▶ Funded Ratio	50.9%
▶ Date of Last Valuation	01/17
▶ Actuary	Segal
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	9.6% Total Increasing
▶ Year Fully Funded	2030
▶ Unfunded Liability	\$307.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$25.8 M

	ACTIVE	RETIRED
▶ Number of Members	1,633	1,310
▶ Total Payroll/Benefit	\$96.6 M	\$36.3 M
▶ Average Salary/Benefit	\$59,100	\$27,700
▶ Average Age	46	NA
▶ Average Service	11.9 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	139
▶ Number Who Reported Earnings	25
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.38%
▶ 2017 Market Value	\$350.8 M
▶ 2013-2017 (Annualized)	9.75%
▶ 1985-2017 (Annualized)	8.79%

## Norfolk County

480 Neponset Street  
Building 15  
Canton, MA 02021  
Phone 781-821-0664  
Fax 781-821-0981

### Board Members

James E. Timilty (Chairperson),  
Paul J. Connors, Karen Jelloe, Edwin S. Little,  
Josephine E. Shea

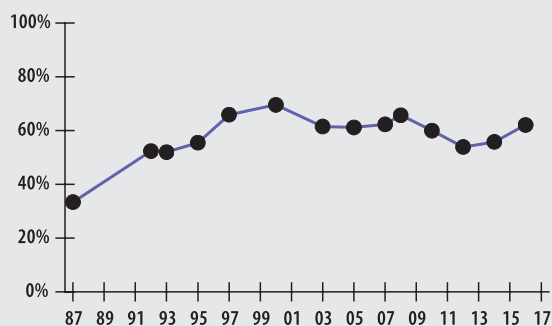
### Board Administrator

Kathleen Kiely-Becchetti

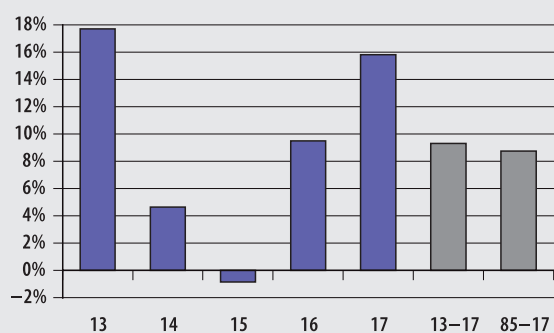
### Board Meeting

Last Wednesday of each month

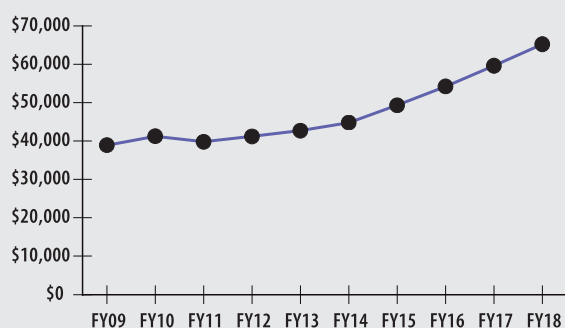
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.76%

**32 years 2016**  
8.55%

**31 years 2015**  
8.52%

**10 years 2017**  
5.73%

**10 years 2016**  
5.18%

**10 years 2015**  
5.62%

**5 years 2017**  
9.32%

**5 years 2016**  
8.82%

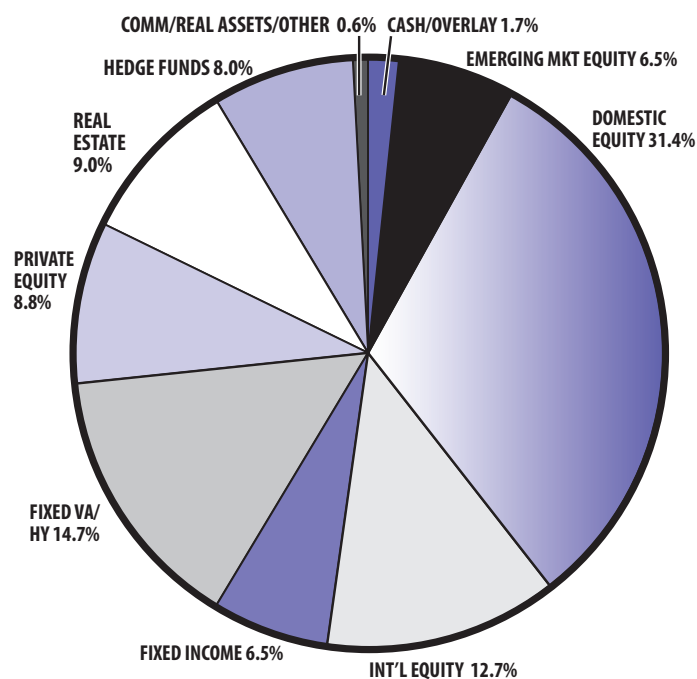
**5 years 2015**  
7.11%

## ACTUARIAL

▶ Funded Ratio	62.1%
▶ Date of Last Valuation	1/16
▶ Actuary	Sherman
▶ Assumed Rate of Return	8.00%
▶ Funding Schedule	4.0% Increasing Phase-In
▶ Year Fully Funded	2029
▶ Unfunded Liability	\$496.3 M
▶ Total Pension Appropriation (Fiscal 2018)	\$65.2 M

	ACTIVE	RETIRED
▶ Number of Members	5,278	3,184
▶ Total Payroll/Benefit	\$267.5 M	\$78.9 M
▶ Average Salary/Benefit	\$50,700	\$24,800
▶ Average Age	NA	73
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	338
▶ Number Who Reported Earnings	93
▶ Number of Excess Earners	1
▶ Total Amount of Refund Due	\$4,758.05

▶ 2017 Return	15.83%
▶ 2017 Market Value	\$958.3 M
▶ 2013-2017 (Annualized)	9.32%
▶ 1985-2017 (Annualized)	8.76%

## North Adams

61 Main Street, Room 247  
North Adams, MA 01247  
Phone 413-663-5185  
Fax 413-664-9412

### Board Members

Lawrence R. O'Brien (Chairperson),  
Matthew LaBonte, Alan Marden,  
Fred T. Thompson, Esq., Kathleen A. Wall

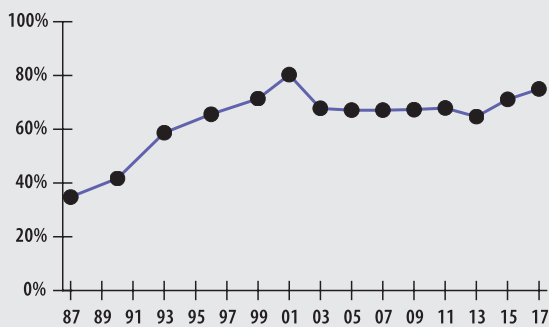
### Board Administrator

Beth Matson

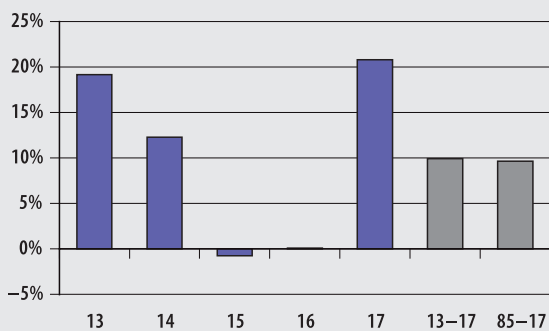
### Board Meeting

Varies

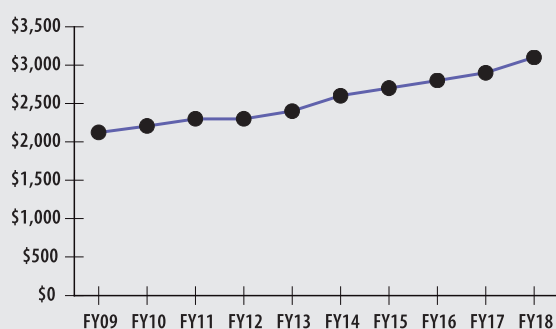
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.64%

#### 32 years 2016

9.31%

#### 31 years 2015

9.62%

#### 10 years 2017

6.90%

#### 10 years 2016

6.51%

#### 10 years 2015

7.43%

#### 5 years 2017

9.94%

#### 5 years 2016

8.13%

#### 5 years 2015

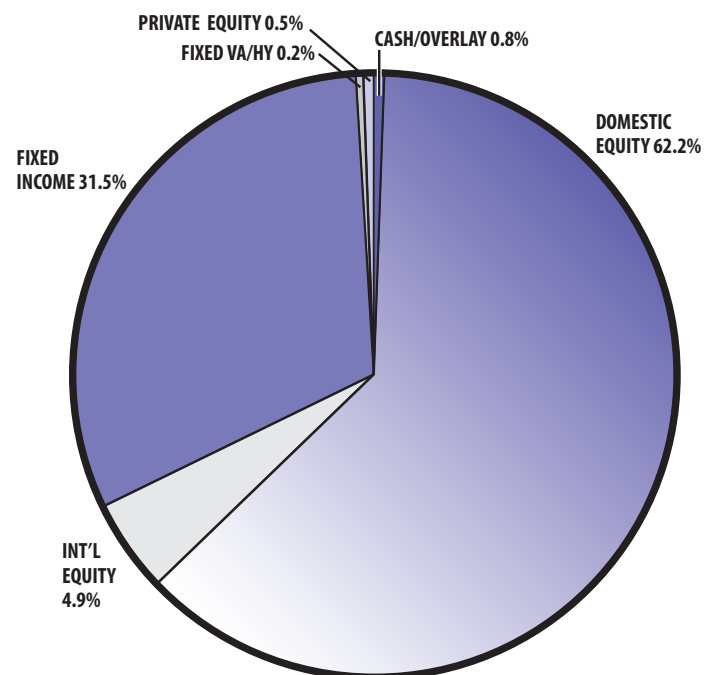
8.93%

## ACTUARIAL

▶ Funded Ratio	75.0%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.40%
▶ Funding Schedule	4.5% Increasing
▶ Year Fully Funded	2029
▶ Unfunded Liability	\$19.3 M
▶ Total Pension Appropriation (Fiscal 2018)	\$3.1 M

	ACTIVE	RETIRED
▶ Number of Members	329	228
▶ Total Payroll/Benefit	\$10.9 M	\$4.5 M
▶ Average Salary/Benefit	\$33,100	\$19,800
▶ Average Age	48	74
▶ Average Service	11.1 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	34
▶ Number Who Reported Earnings	11
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	20.83%
▶ 2017 Market Value	\$63.9 M
▶ 2013-2017 (Annualized)	9.94%
▶ 1985-2017 (Annualized)	9.64%

**Board Members**

Craig R. Chapman (Chairperson),  
John Q. Adams, Brian D. Brousseau,  
Lynn M. Carley, Michael R. Cornetta

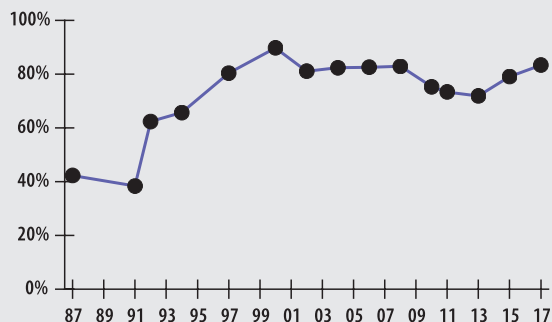
**Board Administrator**

Debra A. Bush

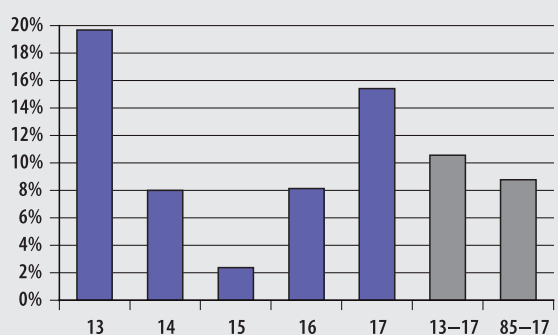
**Board Meeting**

Fourth Tuesday of each month

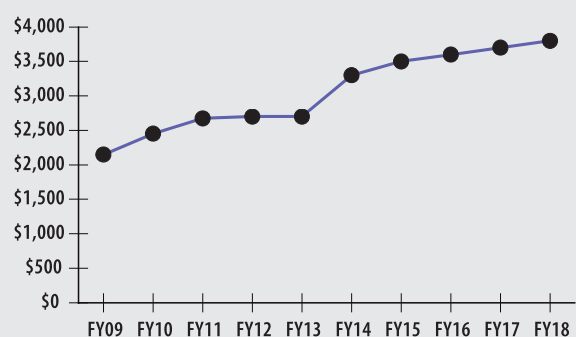
**FUNDED RATIO (1987-2017)**



**INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)**



**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**



**INVESTMENT RETURN HISTORY**

**33 years 2017**  
8.79%

**32 years 2016**  
8.59%

**31 years 2015**  
8.60%

**10 years 2017**  
6.95%

**10 years 2016**  
5.98%

**10 years 2015**  
6.37%

**5 years 2017**  
10.56%

**5 years 2016**  
9.82%

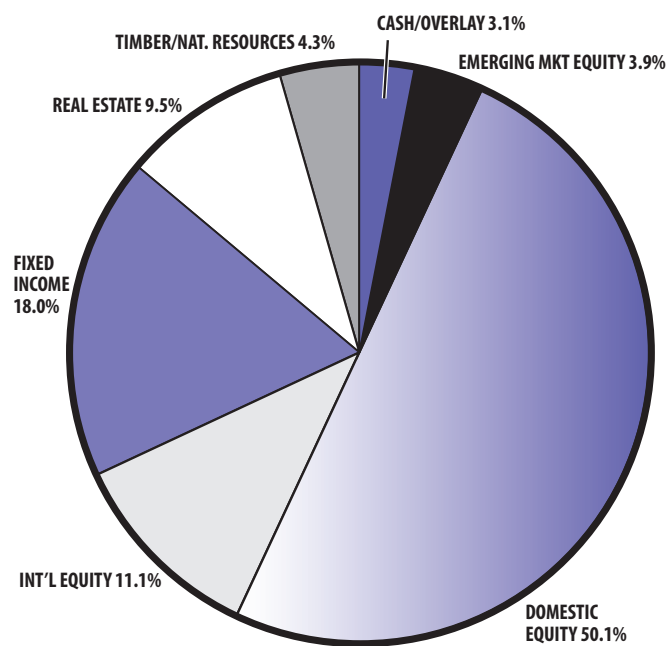
**5 years 2015**  
8.74%

**ACTUARIAL**

▶ Funded Ratio	83.4%
▶ Date of Last Valuation	01/17
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	3.0% Increasing
▶ Year Fully Funded	2027
▶ Unfunded Liability	\$20.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$3.8 M

	ACTIVE	RETIRED
▶ Number of Members	479	266
▶ Total Payroll/Benefit	\$22.9 M	\$6.2 M
▶ Average Salary/Benefit	\$47,800	\$23,400
▶ Average Age	NA	71
▶ Average Service	NA	NA

**ASSET ALLOCATION (12/31/17)**



**EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	27
▶ Number Who Reported Earnings	9
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	15.42%
▶ 2017 Market Value	\$117.1 M
▶ 2013-2017 (Annualized)	10.56%
▶ 1985-2017 (Annualized)	8.79%

## Northampton

240 Main Street, First Floor  
Northampton, MA 01060  
Phone 413-587-1211  
Fax 413-587-1278

### Board Members

Joyce Karpinski (Chairperson),  
Shirley A. LaRose, Michael J. Lyons,  
Thomas F. Sullivan, Susan L. Wright

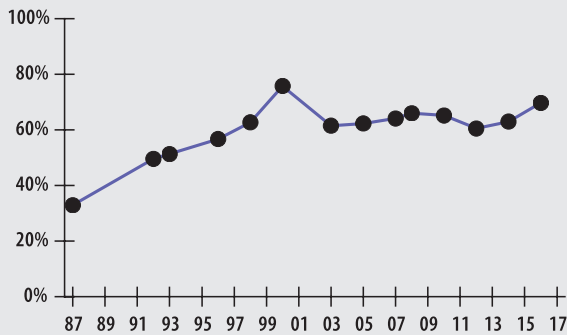
### Board Administrator

David Shipka

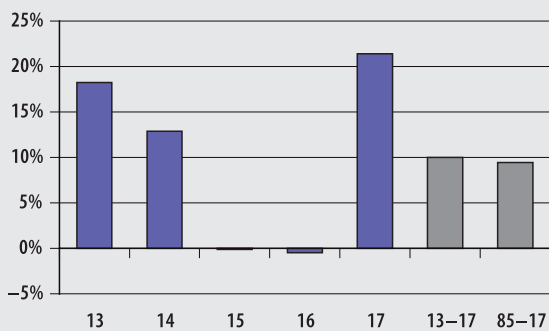
### Board Meeting

Last Tuesday or Thursday of each month

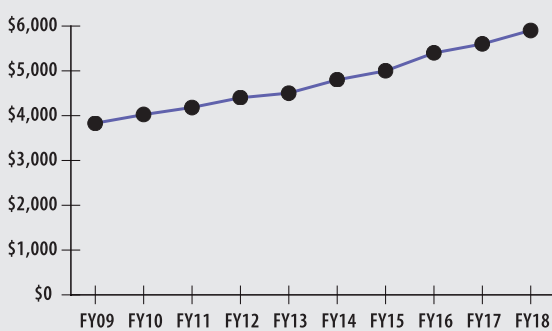
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
9.47%

**32 years 2016**  
9.11%

**31 years 2015**  
9.44%

**10 years 2017**  
7.01%

**10 years 2016**  
6.48%

**10 years 2015**  
7.48%

**5 years 2017**  
10.02%

**5 years 2016**  
8.01%

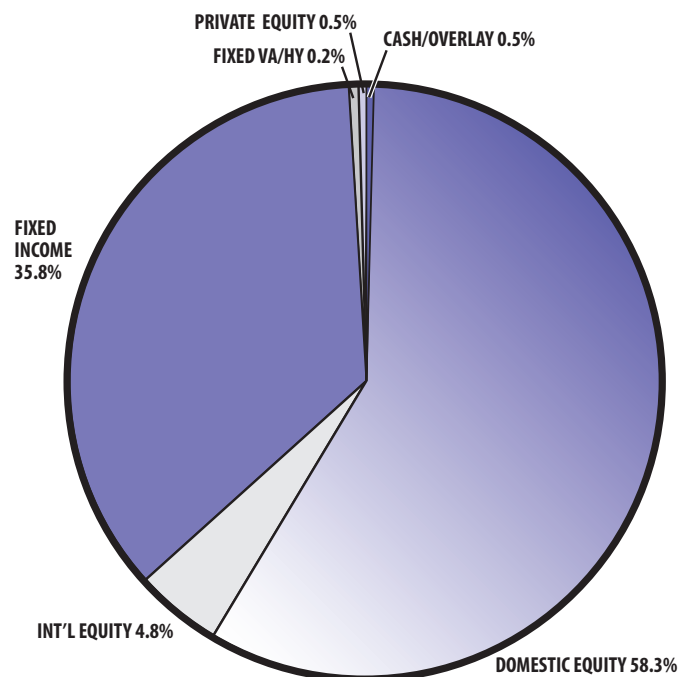
**5 years 2015**  
8.88%

## ACTUARIAL

▶ Funded Ratio	69.7%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	3.65% Increasing
▶ Year Fully Funded	2032
▶ Unfunded Liability	\$48.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$5.9 M

	ACTIVE	RETIRED
▶ Number of Members	633	403
▶ Total Payroll/Benefit	\$26.2 M	\$9.2 M
▶ Average Salary/Benefit	\$41,500	\$22,900
▶ Average Age	46	71
▶ Average Service	10.8 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	40
▶ Number Who Reported Earnings	14
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	21.42%
▶ 2017 Market Value	\$126.1 M
▶ 2013-2017 (Annualized)	10.02%
▶ 1985-2017 (Annualized)	9.47%

## Northbridge

Town Hall  
7 Main Street  
Whitinsville, MA 01588  
Phone 508-234-0820  
Fax 508-234-5834

### Board Members

John Meagher (Chairperson),  
Thomas S. Frieswyk, George Murray,  
Sharon Susienka, Neil Vaidya

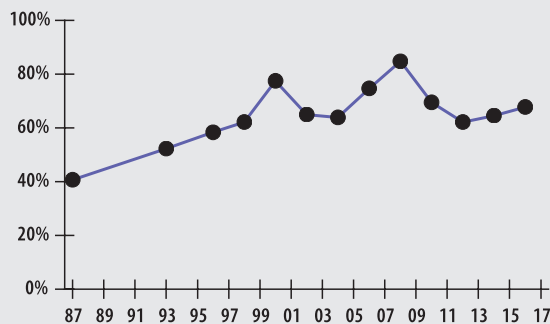
### Board Administrator

Scott McGrath

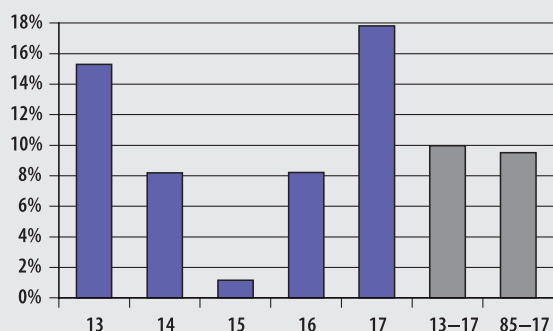
### Board Meeting

Third Wednesday of each month

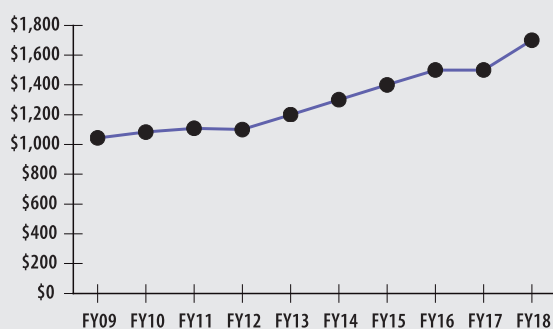
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
9.51%

**32 years 2016**  
9.26%

**31 years 2015**  
9.29%

**10 years 2017**  
5.67%

**10 years 2016**  
5.15%

**10 years 2015**  
5.95%

**5 years 2017**  
9.98%

**5 years 2016**  
9.25%

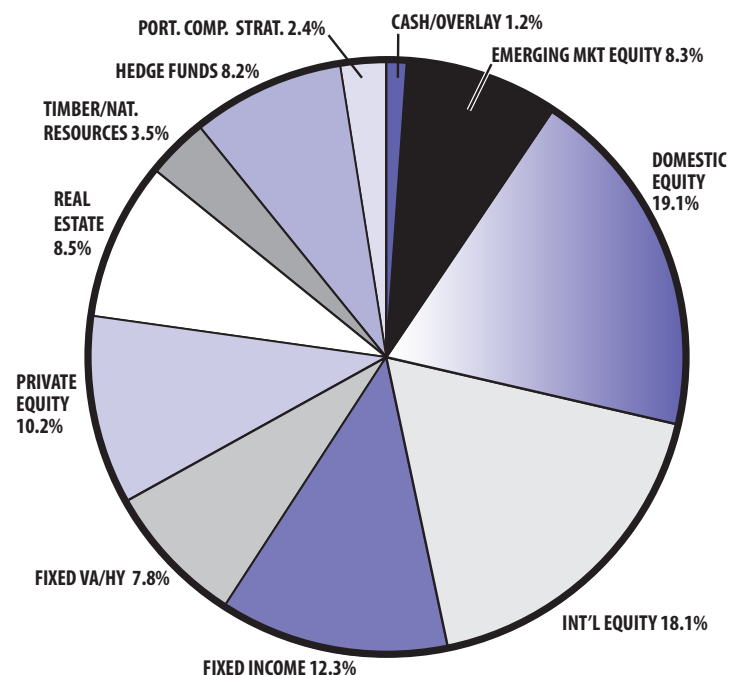
**5 years 2015**  
7.61%

## ACTUARIAL

▶ Funded Ratio	67.8%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.0% Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$14.4 M
▶ Total Pension Appropriation (Fiscal 2018)	\$1.7 M

	ACTIVE	RETIRED
▶ Number of Members	210	116
▶ Total Payroll/Benefit	\$8.5 M	\$2.3 M
▶ Average Salary/Benefit	\$40,500	\$19,800
▶ Average Age	47	74
▶ Average Service	10.0 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	11
▶ Number Who Reported Earnings	3
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.82%
▶ 2017 Market Value	\$35.9 M
▶ 2013-2017 (Annualized)	9.98%
▶ 1985-2017 (Annualized)	9.51%



## Norwood

566 Washington Street  
Norwood, MA 02062  
Phone 781-762-1240, Ext. 157  
Fax 781-278-3024

### Board Members

Ted Mulvehill, Jr., (Chairperson),  
Eileen Hickey, Thomas J. McQuaid,  
Thomas O'Toole, Thomas A. Rorrie

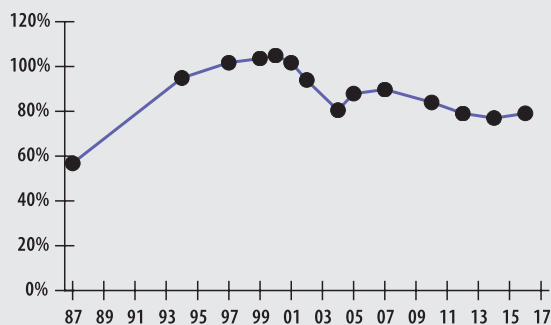
### Board Administrator

Debra A. Wilkes

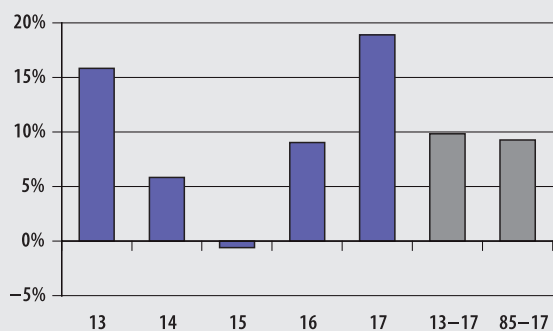
### Board Meeting

Third Thursday of each month

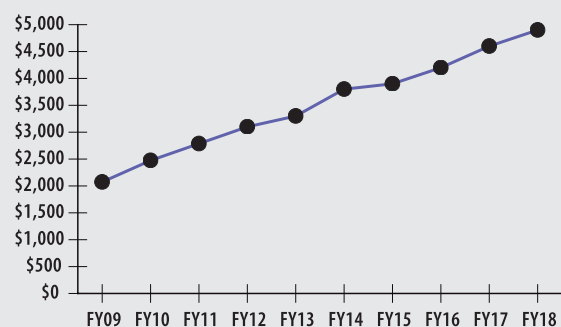
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
9.28%

**32 years 2016**  
8.99%

**31 years 2015**  
8.99%

**10 years 2017**  
7.01%

**10 years 2016**  
6.00%

**10 years 2015**  
6.28%

**5 years 2017**  
9.85%

**5 years 2016**  
8.57%

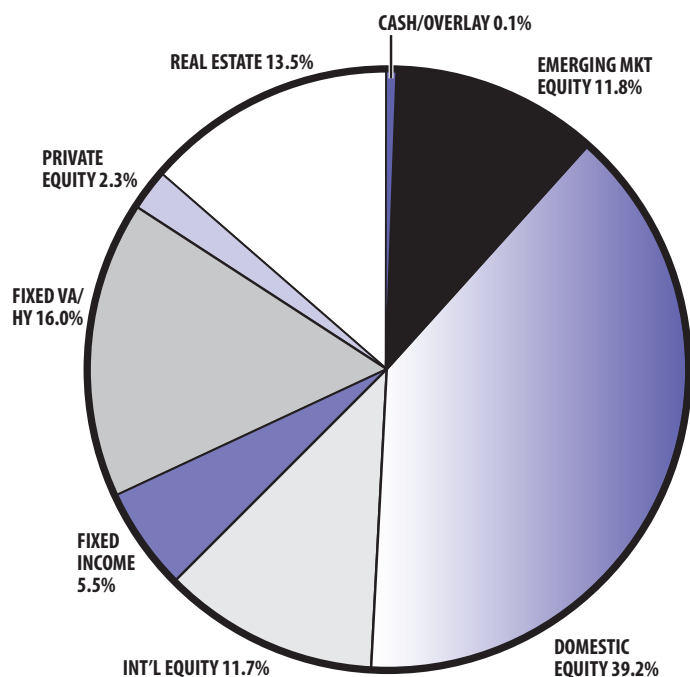
**5 years 2015**  
6.85%

## ACTUARIAL

▶ Funded Ratio	79.1%
▶ Date of Last Valuation	01/16
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.5% Increasing
▶ Year Fully Funded	2028
▶ Unfunded Liability	\$37.5 M
▶ Total Pension Appropriation (Fiscal 2018)	\$4.9 M

	ACTIVE	RETIRED
▶ Number of Members	561	366
▶ Total Payroll/Benefit	\$29.8 M	\$10.4 M
▶ Average Salary/Benefit	\$53,100	\$28,300
▶ Average Age	NA	74
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)

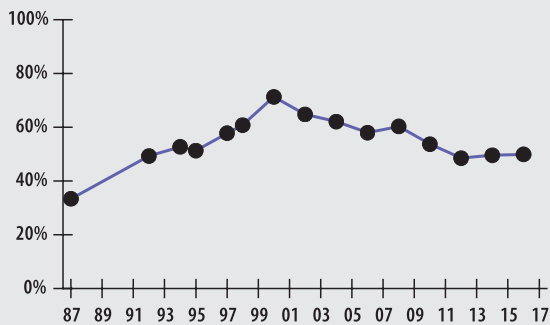


## EARNED INCOME OF DISABILITY RETIREES (2016)

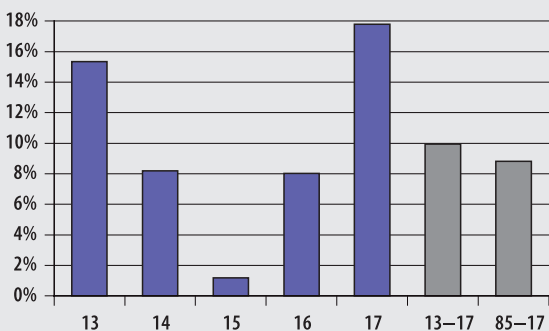
▶ Number of Disability Retirees	42
▶ Number Who Reported Earnings	10
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	18.91%
▶ 2017 Market Value	\$165.1 M
▶ 2013-2017 (Annualized)	9.85%
▶ 1985-2017 (Annualized)	9.28%

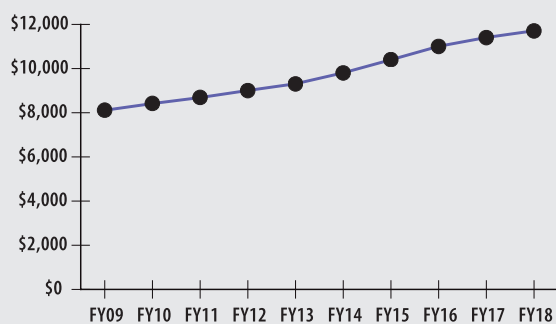
## FUNDED RATIO (1987-2017)



## INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



## 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



## INVESTMENT RETURN HISTORY

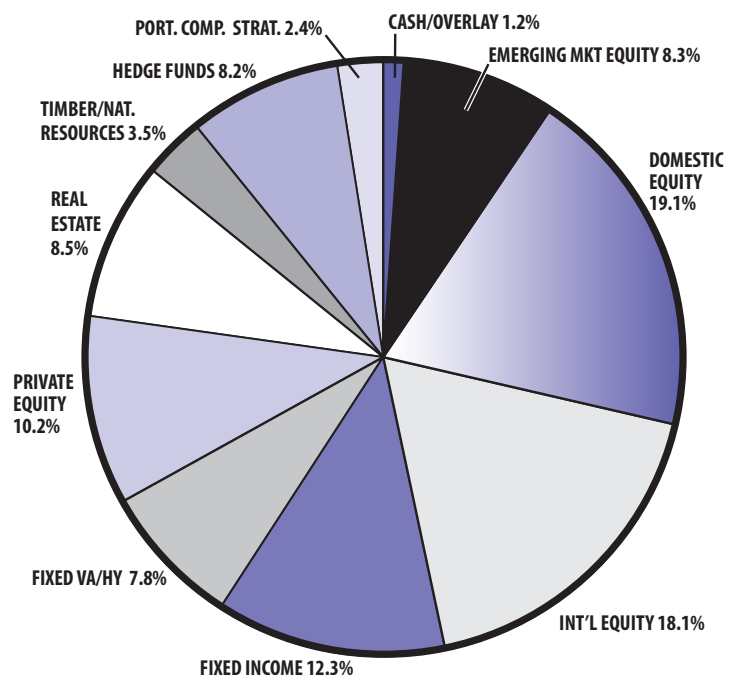
<b>33 years 2017</b> 8.81%	<b>32 years 2016</b> 8.54%	<b>31 years 2015</b> 8.56%
<b>10 years 2017</b> 5.65%	<b>10 years 2016</b> 5.00%	<b>10 years 2015</b> 5.31%
<b>5 years 2017</b> 9.95%	<b>5 years 2016</b> 9.23%	<b>5 years 2015</b> 7.59%

## ACTUARIAL

▶ Funded Ratio	49.9%
▶ Date of Last Valuation	01/16
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.0% Increasing
▶ Year Fully Funded	2036
▶ Unfunded Liability	\$136.8 M
▶ Total Pension Appropriation (Fiscal 2018)	\$11.7 M

	ACTIVE	RETIRED
▶ Number of Members	825	775
▶ Total Payroll/Benefit	\$42.6 M	\$17.7 M
▶ Average Salary/Benefit	\$51,700	\$22,900
▶ Average Age	NA	76
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	59
▶ Number Who Reported Earnings	14
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.80%
▶ 2017 Market Value	\$151.6 M
▶ 2013-2017 (Annualized)	9.95%
▶ 1985-2017 (Annualized)	8.81%

## Pittsfield

114 Fenn Street  
Pittsfield, MA 01201  
Phone 413-499-9468  
Fax 413-499-9328

### Board Members

Edward M. Reilly, Esq. (Chairperson),  
Timothy Bartini, William Flynn,  
Timothy A. Hannigan, Matthew Kerwood

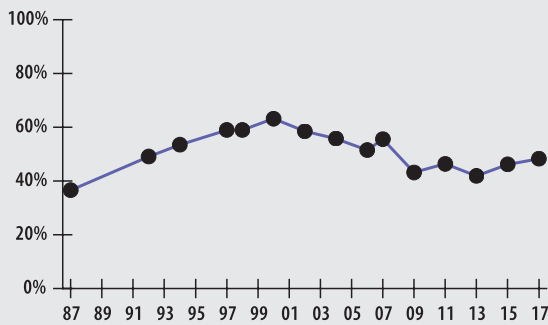
### Board Administrator

Karen L. Lancio

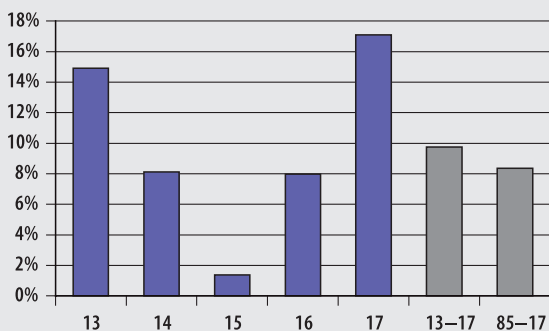
### Board Meeting

Varies

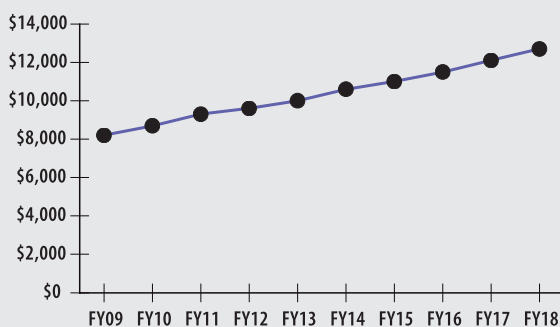
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.37%

**32 years 2016**  
8.11%

**31 years 2015**  
8.12%

**10 years 2017**  
5.58%

**10 years 2016**  
4.73%

**10 years 2015**  
5.12%

**5 years 2017**  
9.76%

**5 years 2016**  
9.13%

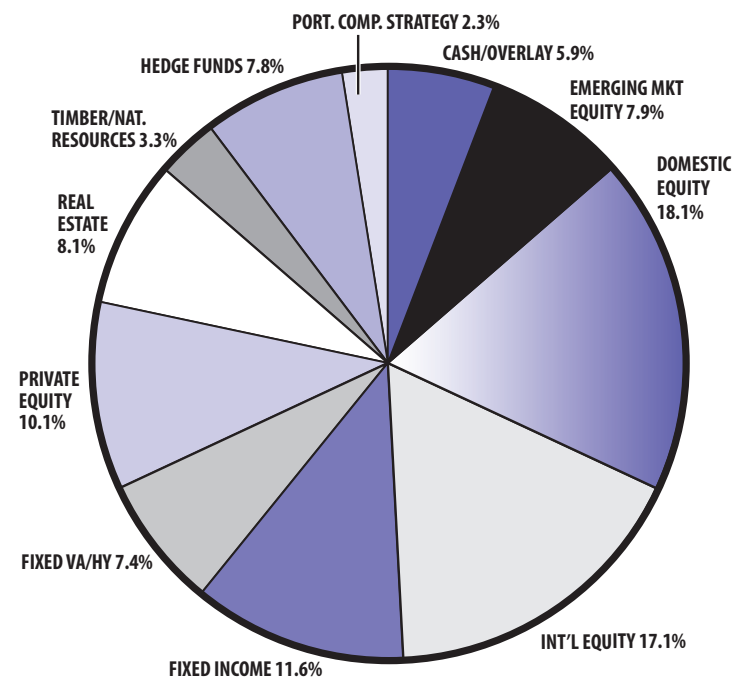
**5 years 2015**  
7.71%

## ACTUARIAL

▶ Funded Ratio	48.3%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	5.1% Total Increasing
▶ Year Fully Funded	2037
▶ Unfunded Liability	\$135.4 M
▶ Total Pension Appropriation (Fiscal 2018)	\$12.7 M

	ACTIVE	RETIRED
▶ Number of Members	955	770
▶ Total Payroll/Benefit	\$35.4 M	\$16.3 M
▶ Average Salary/Benefit	\$37,100	\$21,200
▶ Average Age	48	75
▶ Average Service	11.5 years	NA

## ASSET ALLOCATION (12/31/17)

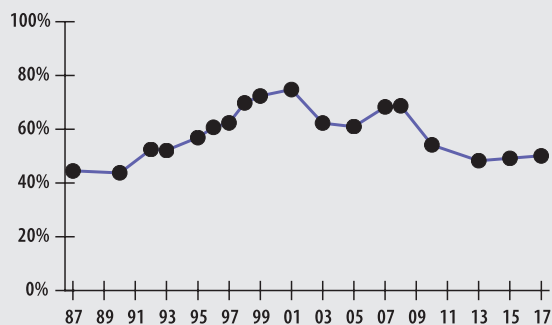


## EARNED INCOME OF DISABILITY RETIREES (2016)

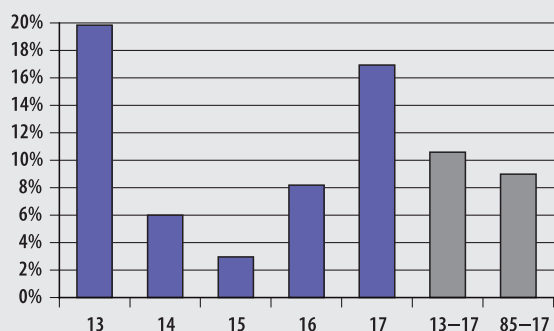
▶ Number of Disability Retirees	90
▶ Number Who Reported Earnings	15
▶ Number of Excess Earners	2
▶ Total Amount of Refund Due	\$46,379.19

▶ 2017 Return	17.09%
▶ 2017 Market Value	\$141.3 M
▶ 2013-2017 (Annualized)	9.76%
▶ 1985-2017 (Annualized)	8.37%

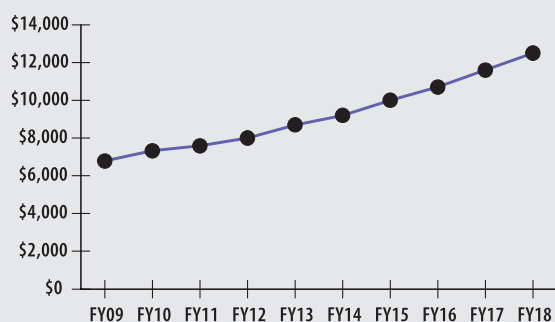
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.99%

**32 years 2016**  
8.75%

**31 years 2015**  
8.77%

**10 years 2017**  
6.52%

**10 years 2016**  
5.70%

**10 years 2015**  
6.26%

**5 years 2017**  
10.61%

**5 years 2016**  
10.24%

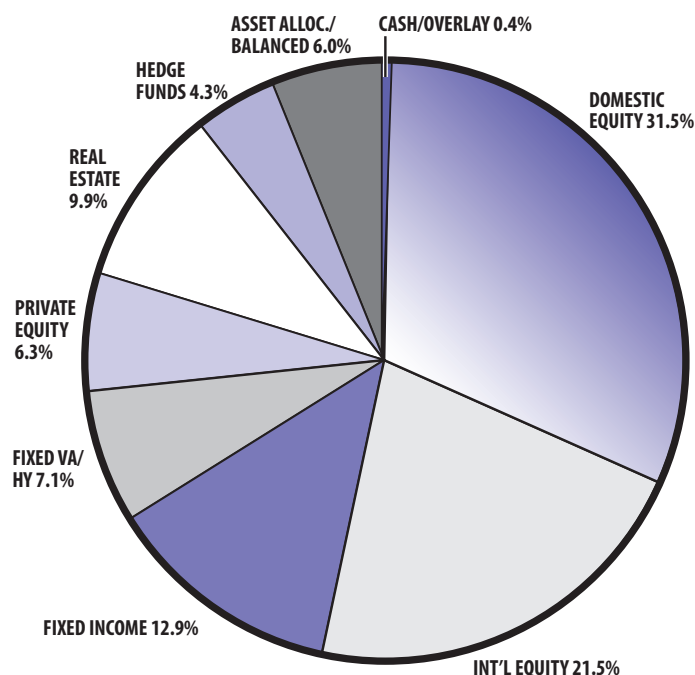
**5 years 2015**  
8.42%

### ACTUARIAL

▶ Funded Ratio	50.1%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.25%
▶ Funding Schedule	8.0% Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$157.6 M
▶ Total Pension Appropriation (Fiscal 2018)	\$12.5 M

	ACTIVE	RETIRED
▶ Number of Members	897	710
▶ Total Payroll/Benefit	\$43.5 M	\$17.2 M
▶ Average Salary/Benefit	\$48,500	\$24,300
▶ Average Age	48	70
▶ Average Service	12.0 years	NA

### ASSET ALLOCATION (12/31/17)



### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	84
▶ Number Who Reported Earnings	27
▶ Number of Excess Earners	1
▶ Total Amount of Refund Due	\$6,079.20

▶ 2017 Return	16.95%
▶ 2017 Market Value	\$177.8 M
▶ 2013-2017 (Annualized)	10.61%
▶ 1985-2017 (Annualized)	8.99%

**Board Members**

Thomas J. O'Brien (Chairperson),  
Mary Beth Carter, James E. Harrington,  
Joseph F. McDonough, Esq.,  
John F. Sciara

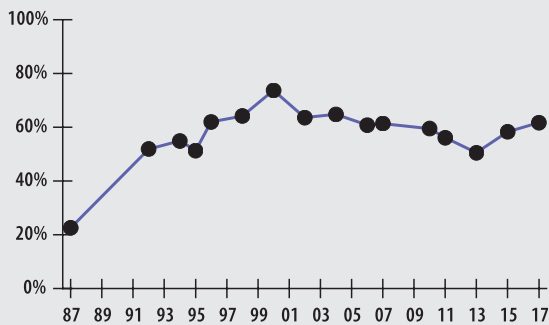
**Board Administrator**

David J. Sullivan

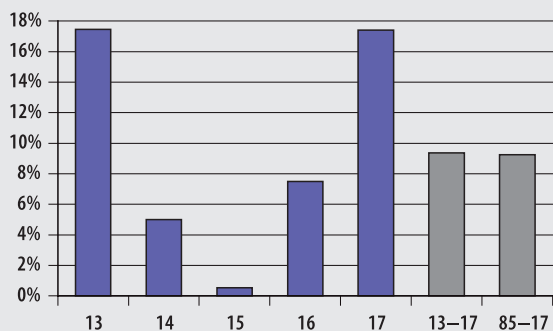
**Board Meeting**

Usually the last Tuesday of each month

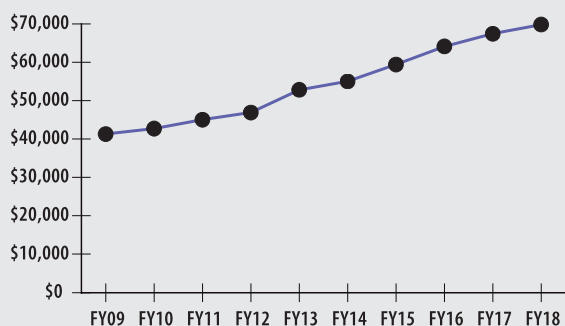
**FUNDED RATIO (1987-2017)**



**INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)**



**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**



**INVESTMENT RETURN HISTORY**

**33 years 2017**  
9.25%

**32 years 2016**  
9.00%

**31 years 2015**  
9.05%

**10 years 2017**  
5.74%

**10 years 2016**  
4.82%

**10 years 2015**  
5.58%

**5 years 2017**  
9.37%

**5 years 2016**  
8.47%

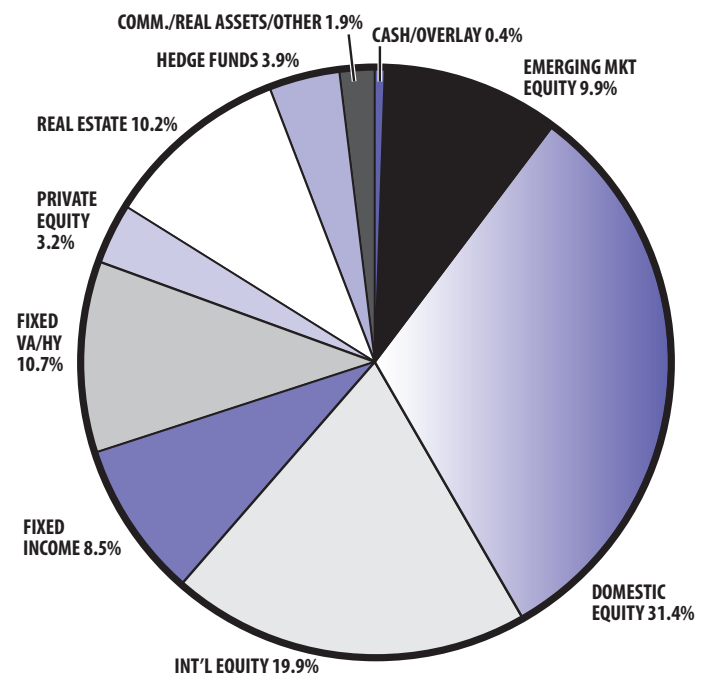
**5 years 2015**  
7.02%

**ACTUARIAL**

▶ Funded Ratio	61.7%
▶ Date of Last Valuation	01/17
▶ Actuary	Sherman
▶ Assumed Rate of Return	8.00%
▶ Funding Schedule	3.5% Increasing
▶ Year Fully Funded	2029
▶ Unfunded Liability	\$582.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$69.8 M

	ACTIVE	RETIRED
▶ Number of Members	5,815	3,968
▶ Total Payroll/Benefit	\$265.0 M	\$93.7 M
▶ Average Salary/Benefit	\$45,600	\$23,600
▶ Average Age	NA	72
▶ Average Service	NA	NA

**ASSET ALLOCATION (12/31/17)**



**EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	354
▶ Number Who Reported Earnings	85
▶ Number of Excess Earners	2
▶ Total Amount of Refund Due	\$12,973.31

▶ 2017 Return	17.41%
▶ 2017 Market Value	\$1.0 B
▶ 2013-2017 (Annualized)	9.37%
▶ 1985-2017 (Annualized)	9.25%

## Quincy

1245 Hancock Street  
Suite 39  
Quincy, MA 02169  
Phone 617-376-1075  
Fax 617-376-1149

### Board Members

Susan M. O'Connor (Chairperson),  
Ernest Arienti, Leo Coppens,  
Richard D. Fitzpatrick, Michael McFarland

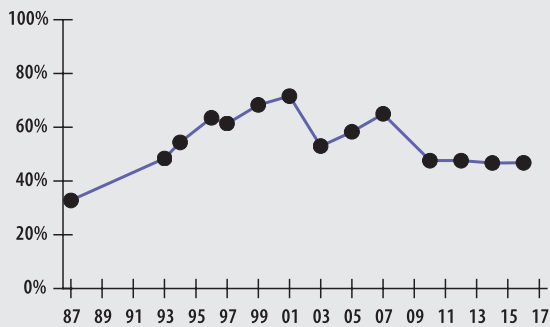
### Board Administrator

Edward J. Masterson

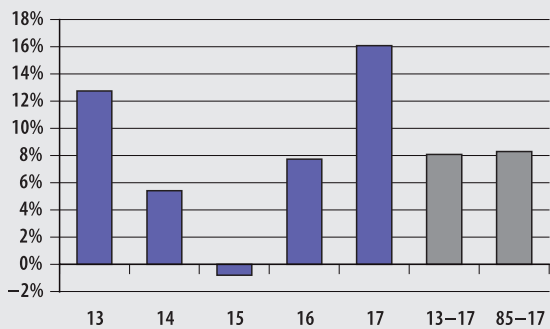
### Board Meeting

Varies

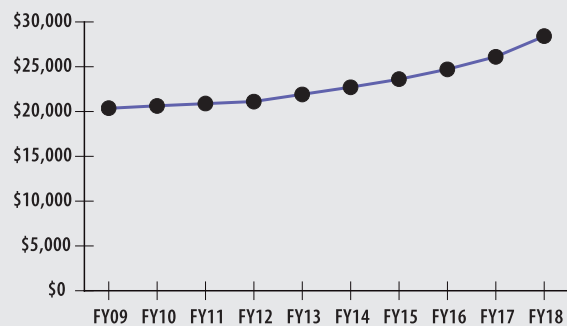
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

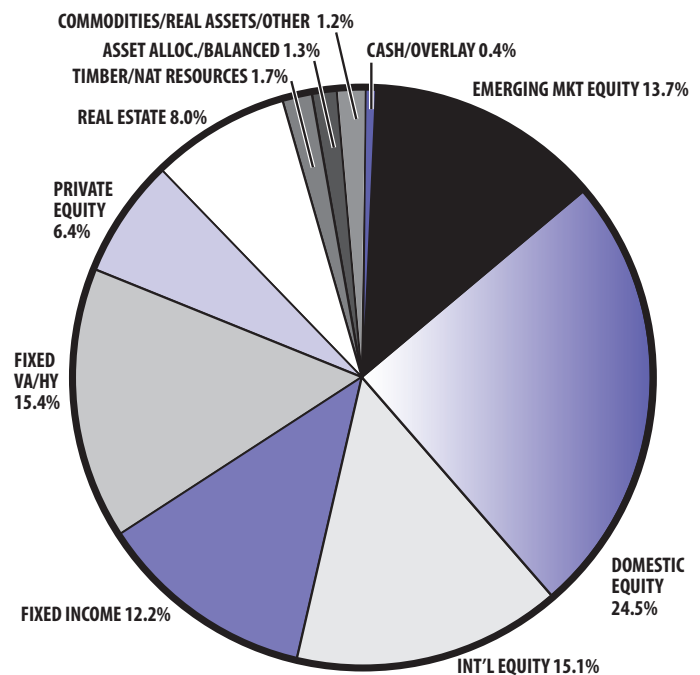
<b>33 years 2017</b>	<b>32 years 2016</b>	<b>31 years 2015</b>
8.31%	8.08%	8.09%
<b>10 years 2017</b>	<b>10 years 2016</b>	<b>10 years 2015</b>
5.30%	4.42%	4.94%
<b>5 years 2017</b>	<b>5 years 2016</b>	<b>5 years 2015</b>
8.08%	7.47%	5.97%

## ACTUARIAL

▶ Funded Ratio	46.8%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2036
▶ Unfunded Liability	\$359.1 M
▶ Total Pension Appropriation (Fiscal 2018)	\$28.4 M

	ACTIVE	RETIRED
▶ Number of Members	1,416	1,520
▶ Total Payroll/Benefit	\$88.1 M	\$43.1 M
▶ Average Salary/Benefit	\$62,200	\$28,400
▶ Average Age	50	74
▶ Average Service	13.0 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	156
▶ Number Who Reported Earnings	30
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	16.08%
▶ 2017 Market Value	\$335.5 M
▶ 2013-2017 (Annualized)	8.08%
▶ 1985-2017 (Annualized)	8.31%

## Reading

2 Haven Street, Unit 307  
Reading, MA 01867  
Phone 781-942-9007  
Fax 781-623-3053

## Board Members

Joseph R. Veno (Chairperson),  
Sharon M. Angstrom, Thomas A. Clough,  
David Gentile, Carol Roberts

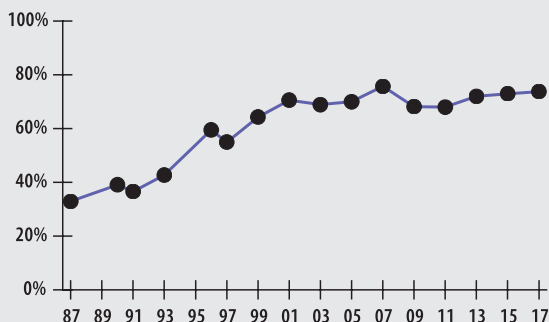
## Board Administrator

Colleen Loughlin

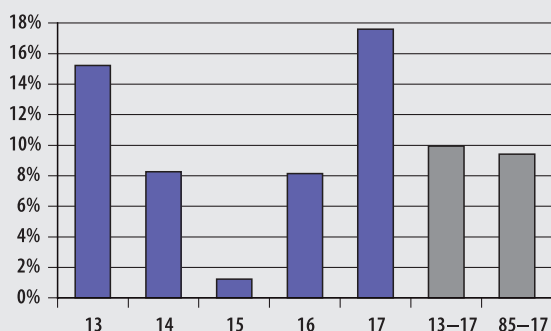
## Board Meeting

Fourth Tuesday of each month at 6:00 pm

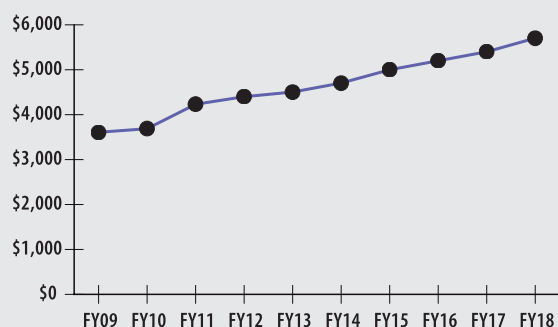
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
9.43%

**32 years 2016**  
9.18%

**31 years 2015**  
9.22%

**10 years 2017**  
5.67%

**10 years 2016**  
5.17%

**10 years 2015**  
5.99%

**5 years 2017**  
9.94%

**5 years 2016**  
9.29%

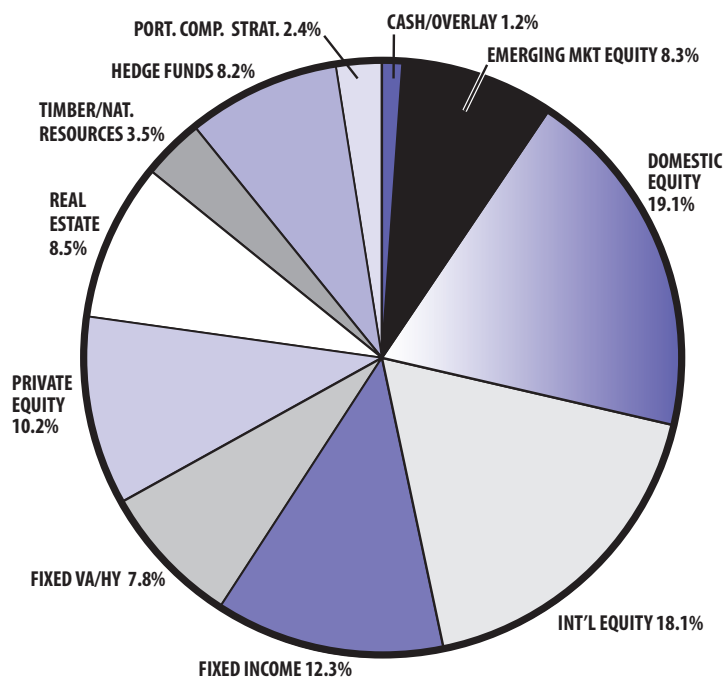
**5 years 2015**  
7.63%

## ACTUARIAL

▶ Funded Ratio	73.8%
▶ Date of Last Valuation	01/17
▶ Actuary	KMS
▶ Assumed Rate of Return	7.65%
▶ Funding Schedule	5.34% Total Increasing
▶ Year Fully Funded	2029
▶ Unfunded Liability	\$45.4 M
▶ Total Pension Appropriation (Fiscal 2018)	\$5.7 M

	ACTIVE	RETIRED
▶ Number of Members	341	345
▶ Total Payroll/Benefit	\$24.9 M	\$10.3 M
▶ Average Salary/Benefit	\$73,000	\$30,000
▶ Average Age	48	74
▶ Average Service	14.1 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	43
▶ Number Who Reported Earnings	9
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.60%
▶ 2017 Market Value	\$141.8 M
▶ 2013-2017 (Annualized)	9.94%
▶ 1985-2017 (Annualized)	9.43%

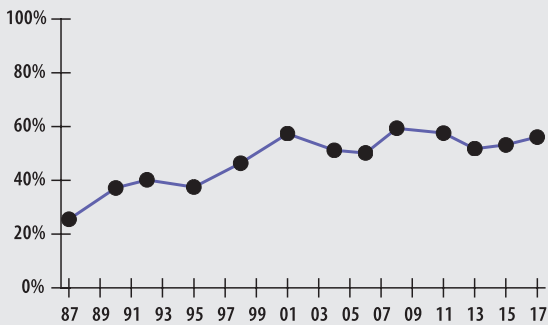
## Revere

City Hall  
281 Broadway  
Revere, MA 02151  
Phone 781-286-8173  
Fax 781-286-3316

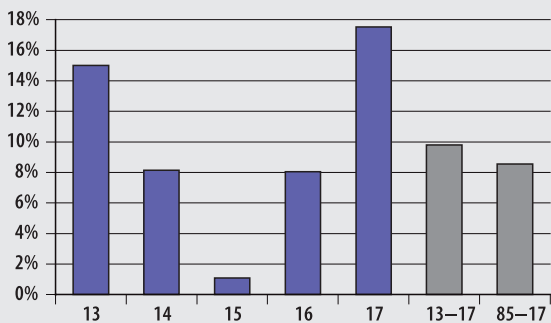
**Board Members**  
John Henry (Chairperson),  
Gennaro Cataldo, James Cullen,  
Sean Manion, Richard Viscay

**Board Administrator**  
Sandor Zapolin  
**Board Meeting**  
Varies

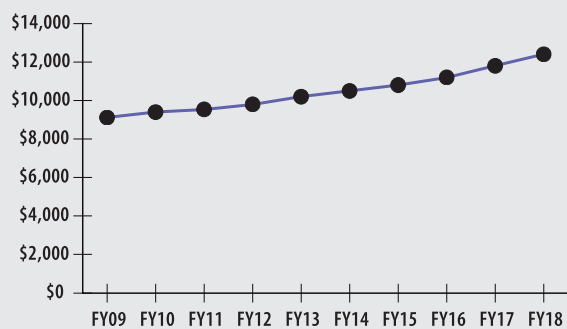
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

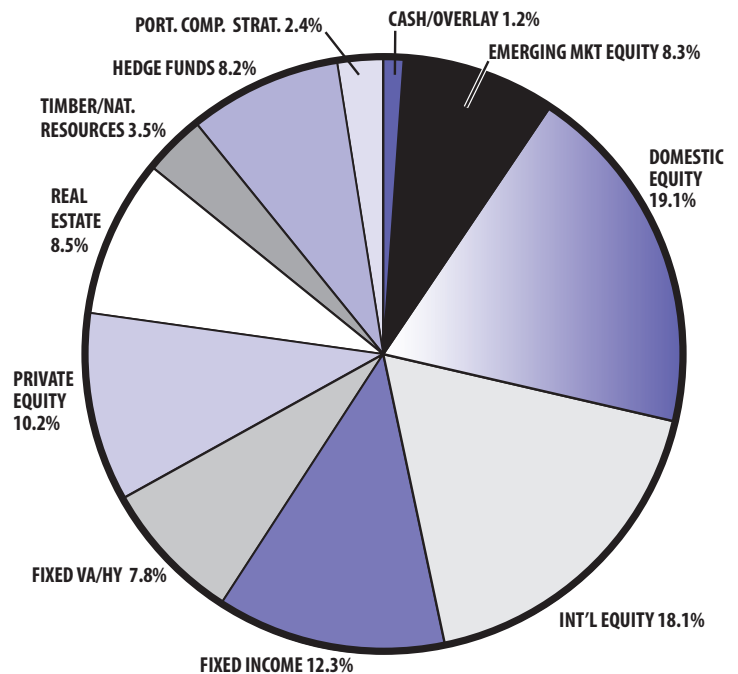
<b>33 years 2017</b> 8.56%	<b>32 years 2016</b> 8.29%	<b>31 years 2015</b> 8.30%
<b>10 years 2017</b> 5.53%	<b>10 years 2016</b> 4.96%	<b>10 years 2015</b> 5.73%
<b>5 years 2017</b> 9.81%	<b>5 years 2016</b> 9.08%	<b>5 years 2015</b> 7.42%

## ACTUARIAL

▶ Funded Ratio	56.1%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.40%
▶ Funding Schedule	5.0% Total Increasing
▶ Year Fully Funded	2033
▶ Unfunded Liability	\$108.3 M
▶ Total Pension Appropriation (Fiscal 2018)	\$12.4 M

	ACTIVE	RETIRED
▶ Number of Members	560	509
▶ Total Payroll/Benefit	\$33.3 M	\$15.1 M
▶ Average Salary/Benefit	\$59,500	\$29,600
▶ Average Age	50	75
▶ Average Service	13.5 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	112
▶ Number Who Reported Earnings	31
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.54%
▶ 2017 Market Value	\$157.4 M
▶ 2013-2017 (Annualized)	9.81%
▶ 1985-2017 (Annualized)	8.56%



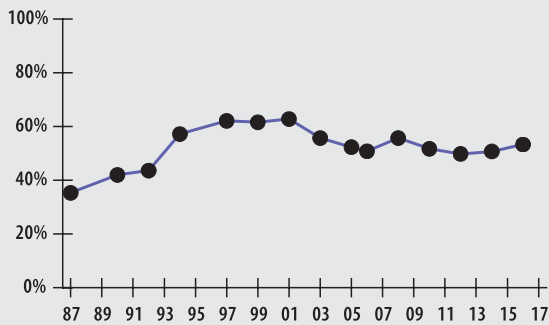
## Salem

20 Central Street  
Suite 110  
Salem, MA 01970  
Phone 978-745-8983  
Fax 978-745-4216

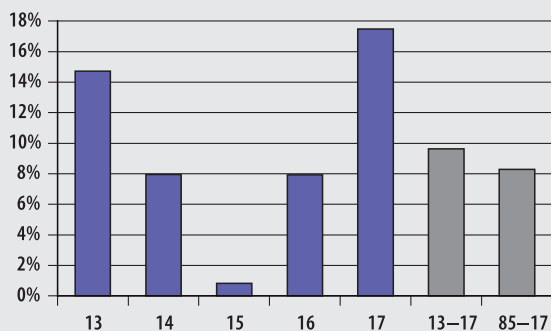
**Board Members**  
Dominick Pangallo (Chairperson),  
Laurie Giardella, Sally Hayes,  
Robert Lutts, Marcia Pelletier

**Board Administrator**  
Paul Findlen  
**Board Meeting**  
Last Wednesday of each month

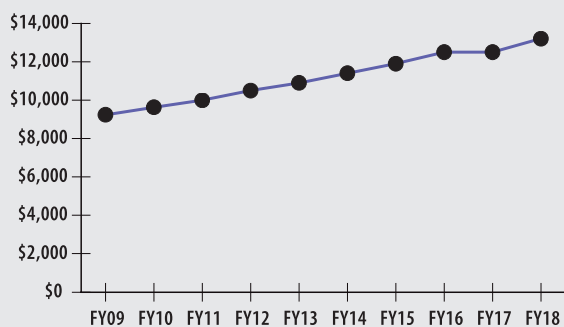
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



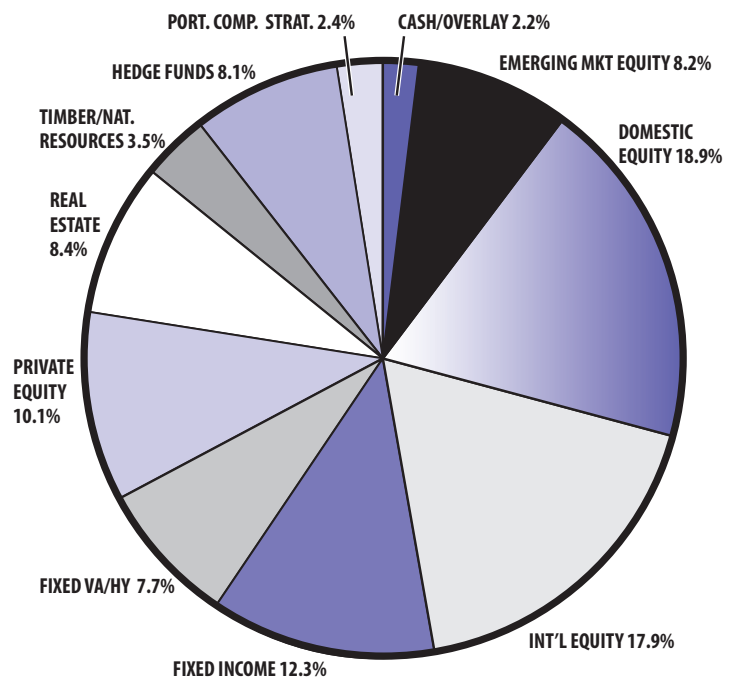
### INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 8.30%	<b>32 years 2016</b> 8.03%	<b>31 years 2015</b> 8.03%
<b>10 years 2017</b> 5.17%	<b>10 years 2016</b> 4.27%	<b>10 years 2015</b> 4.94%
<b>5 years 2017</b> 9.63%	<b>5 years 2016</b> 8.73%	<b>5 years 2015</b> 7.19%

## ACTUARIAL

▶ Funded Ratio		53.3%
▶ Date of Last Valuation		01/16
▶ Actuary		Segal
▶ Assumed Rate of Return		7.50%
▶ Funding Schedule	5.15 % Total Increasing	
▶ Year Fully Funded		2031
▶ Unfunded Liability		\$125.7 M
▶ Total Pension Appropriation (Fiscal 2018)		\$13.2 M
	<b>ACTIVE</b>	<b>RETIRED</b>
▶ Number of Members	910	573
▶ Total Payroll/Benefit	\$43.9 M	\$13.4 M
▶ Average Salary/Benefit	\$48,300	\$23,400
▶ Average Age	49	75
▶ Average Service	12.2 years	NA

## ASSET ALLOCATION (12/31/17)

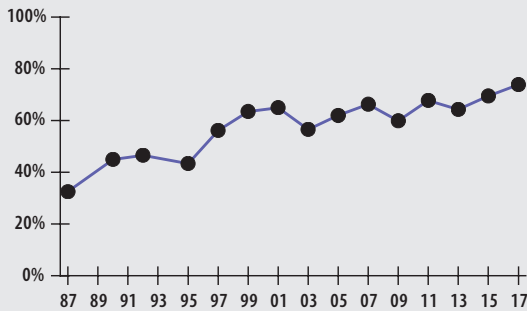


## EARNED INCOME OF DISABILITY RETIREES (2016)

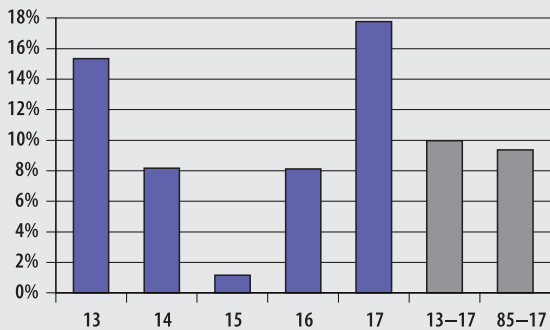
▶ Number of Disability Retirees	62
▶ Number Who Reported Earnings	11
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.48%
▶ 2017 Market Value	\$177.3 M
▶ 2013-2017 (Annualized)	9.63%
▶ 1985-2017 (Annualized)	8.30%

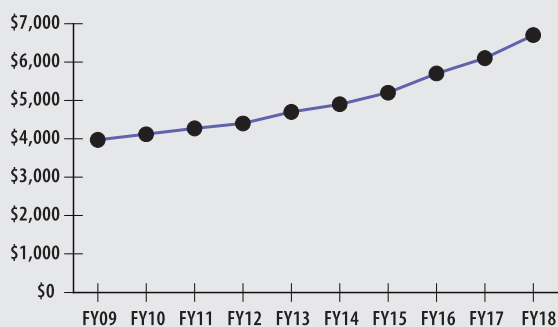
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

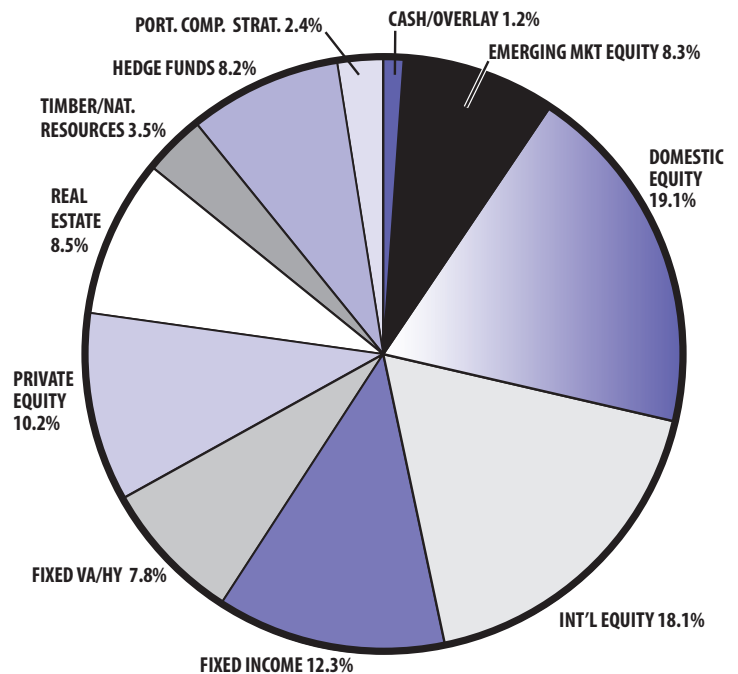
<b>33 years 2017</b> 9.38%	<b>32 years 2016</b> 9.13%	<b>31 years 2015</b> 9.16%
<b>10 years 2017</b> 5.66%	<b>10 years 2016</b> 5.13%	<b>10 years 2015</b> 5.95%
<b>5 years 2017</b> 9.96%	<b>5 years 2016</b> 9.22%	<b>5 years 2015</b> 7.59%

### ACTUARIAL

▶ Funded Ratio	73.9%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.40%
▶ Funding Schedule	3.5% Total Increasing
▶ Year Fully Funded	2026
▶ Unfunded Liability	\$32.5 M
▶ Total Pension Appropriation (Fiscal 2018)	\$6.7 M

	ACTIVE	RETIRED
▶ Number of Members	372	282
▶ Total Payroll/Benefit	\$17.5 M	\$7.4 M
▶ Average Salary/Benefit	\$47,100	\$26,400
▶ Average Age	46	74
▶ Average Service	11.7 years	NA

### ASSET ALLOCATION (12/31/17)

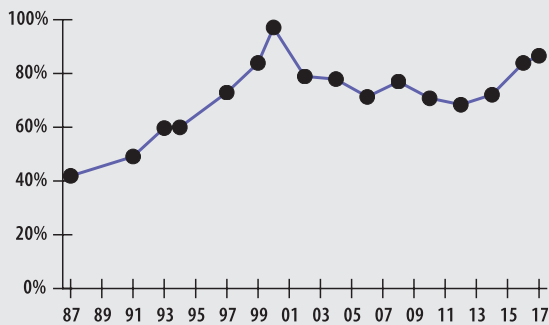


### EARNED INCOME OF DISABILITY RETIREES (2016)

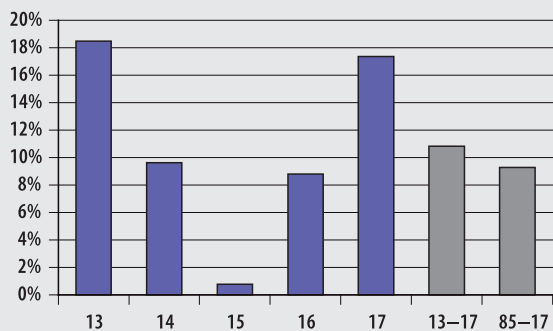
▶ Number of Disability Retirees	39
▶ Number Who Reported Earnings	5
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.77%
▶ 2017 Market Value	\$102.3 M
▶ 2013-2017 (Annualized)	9.96%
▶ 1985-2017 (Annualized)	9.38%

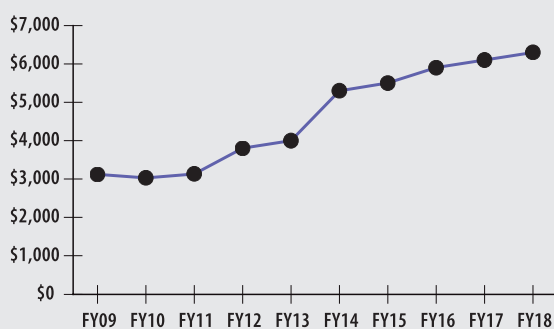
## FUNDED RATIO (1987-2017)



## INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



## 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



## INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 9.30%	<b>32 years 2016</b> 9.06%	<b>31 years 2015</b> 9.06%
<b>10 years 2017</b> 6.59%	<b>10 years 2016</b> 5.89%	<b>10 years 2015</b> 6.27%
<b>5 years 2017</b> 10.83%	<b>5 years 2016</b> 10.17%	<b>5 years 2015</b> 8.37%

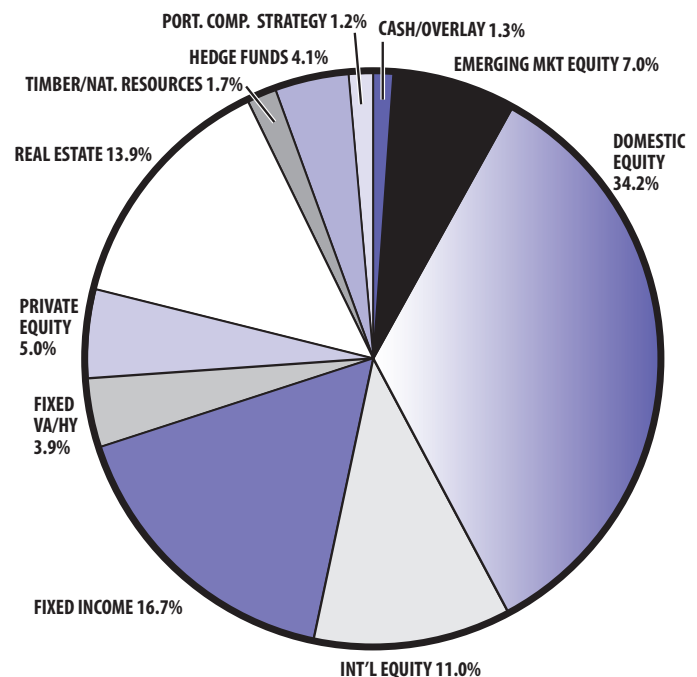
## ACTUARIAL

▶ Funded Ratio	86.6%
▶ Date of Last Valuation	01/17
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	Level
▶ Year Fully Funded	2021
▶ Unfunded Liability	\$16.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$6.3 M

	ACTIVE	RETIRED
▶ Number of Members	472	274
▶ Total Payroll/Benefit	\$24.5 M	\$7.3 M
▶ Average Salary/Benefit	\$51,800	\$26,600
▶ Average Age	NA	73
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	28
▶ Number Who Reported Earnings	9
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.38%
▶ 2017 Market Value	\$125.2 M
▶ 2013-2017 (Annualized)	10.83%
▶ 1985-2017 (Annualized)	9.30%

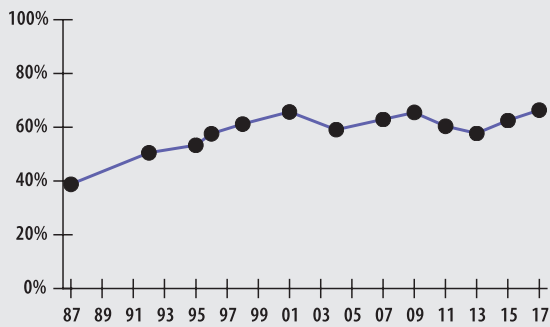
## Somerville

City Hall Annex  
50 Evergreen Avenue  
Somerville, MA 02145  
Phone 617-625-6600, X4600  
Fax 617-666-4325

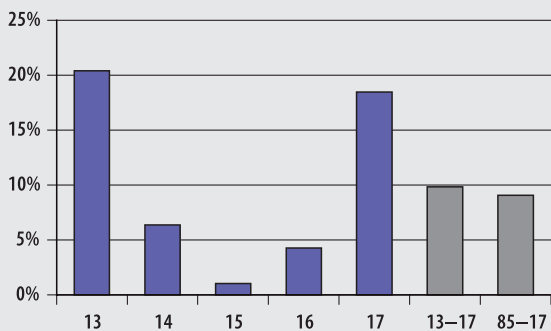
**Board Members**  
Edward F. Bean, Jr. (Chairperson),  
John M. Memory, Alex Nosnik,  
Thomas Ross

**Board Administrator**  
Michael Pasquariello  
**Board Meeting**  
Varies

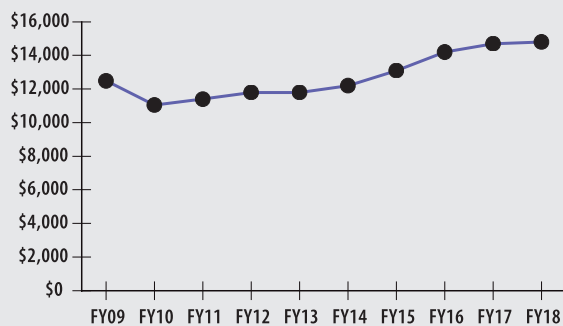
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

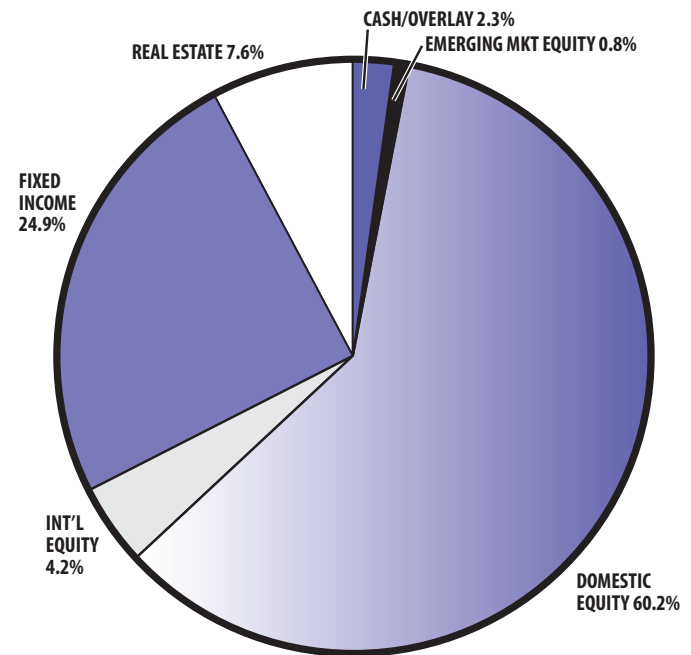
<b>33 years 2017</b> 9.07%	<b>32 years 2016</b> 8.79%	<b>31 years 2015</b> 8.94%
<b>10 years 2017</b> 6.90%	<b>10 years 2016</b> 6.32%	<b>10 years 2015</b> 7.07%
<b>5 years 2017</b> 9.85%	<b>5 years 2016</b> 9.28%	<b>5 years 2015</b> 8.90%

## ACTUARIAL

▶ Funded Ratio	66.4%
▶ Date of Last Valuation	01/17
▶ Actuary	Sherman
▶ Assumed Rate of Return	8.00%
▶ Funding Schedule	3.5% Increasing
▶ Year Fully Funded	2033
▶ Unfunded Liability	\$132.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$14.8 M

	ACTIVE	RETIRED
▶ Number of Members	1,195	906
▶ Total Payroll/Benefit	\$71.5 M	\$25.8 M
▶ Average Salary/Benefit	\$59,800	\$28,500
▶ Average Age	NA	75
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	121
▶ Number Who Reported Earnings	28
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	18.48%
▶ 2017 Market Value	\$279.4 M
▶ 2013-2017 (Annualized)	9.85%
▶ 1985-2017 (Annualized)	9.07%

## Southbridge

Town Hall  
41 Elm Street  
Southbridge, MA 01550  
Phone 508-765-4903  
Fax 508-765-0902

### Board Members

Melinda Ernst-Fournier (Chairperson),  
Karen Harnois, Pamela Leduc,  
Julie Pena, James Philbrook

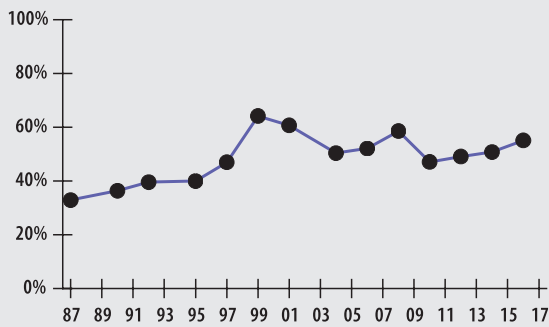
### Board Administrator

Kristin LaPlante

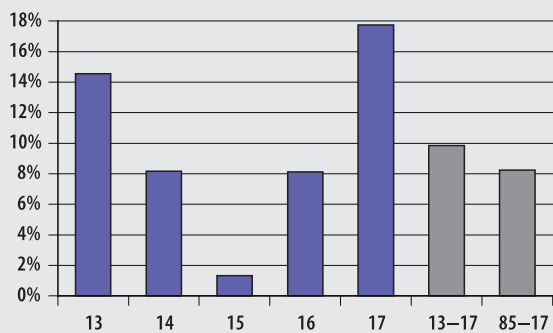
### Board Meeting

Varies

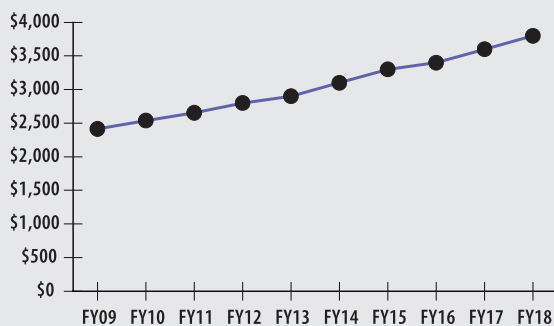
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

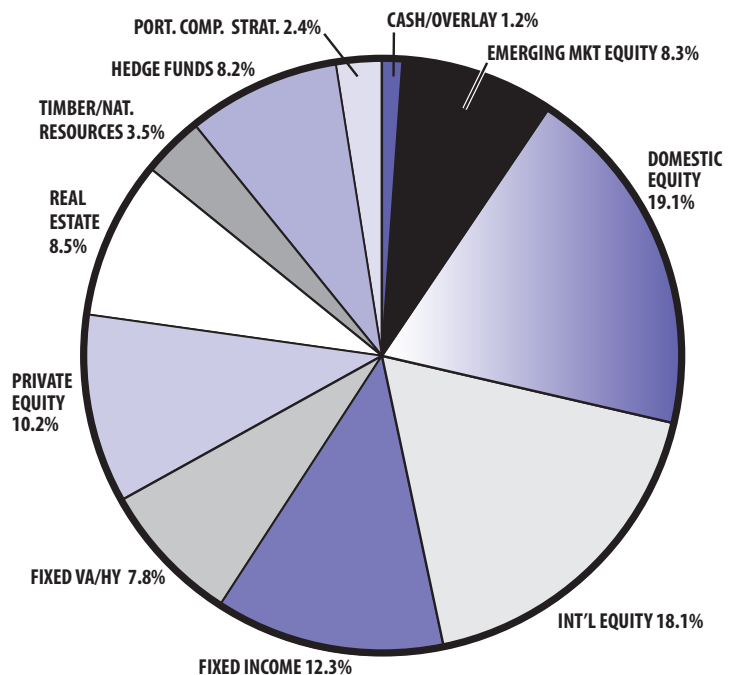
<b>33 years 2017</b> 8.24%	<b>32 years 2016</b> 7.95%	<b>31 years 2015</b> 7.95%
<b>10 years 2017</b> 4.81%	<b>10 years 2016</b> 3.78%	<b>10 years 2015</b> 4.25%
<b>5 years 2017</b> 9.84%	<b>5 years 2016</b> 8.95%	<b>5 years 2015</b> 7.27%

## ACTUARIAL

▶ Funded Ratio	55.1%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	5.5% Total Increasing
▶ Year Fully Funded	2034
▶ Unfunded Liability	\$34.6 M
▶ Total Pension Appropriation (Fiscal 2018)	\$3.8 M

	ACTIVE	RETIRED
▶ Number of Members	357	180
▶ Total Payroll/Benefit	\$14.9 M	\$3.9 M
▶ Average Salary/Benefit	\$41,600	\$21,900
▶ Average Age	47	73
▶ Average Service	10.0 years	NA

## ASSET ALLOCATION (12/31/17)

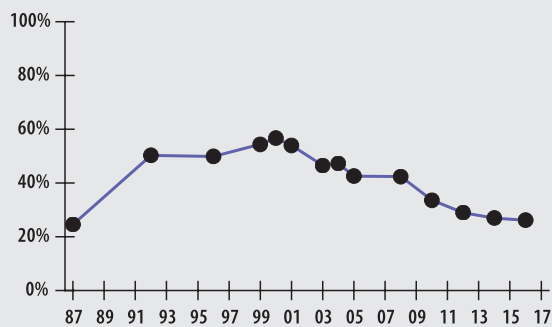


## EARNED INCOME OF DISABILITY RETIREES (2016)

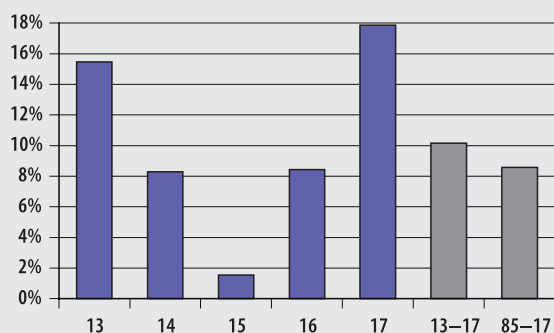
▶ Number of Disability Retirees	16
▶ Number Who Reported Earnings	3
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.74%
▶ 2017 Market Value	\$53.7 M
▶ 2013-2017 (Annualized)	9.84%
▶ 1985-2017 (Annualized)	8.24%

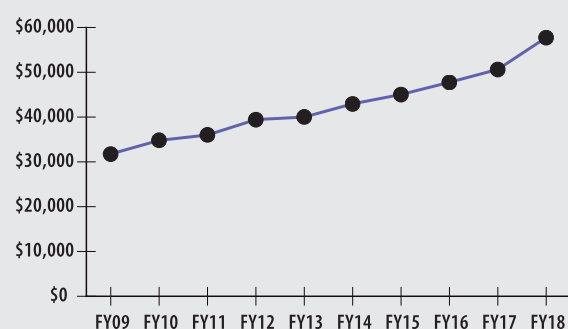
## FUNDED RATIO (1987-2017)



## INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



## 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



## INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 8.58%	<b>32 years 2016</b> 8.30%	<b>31 years 2015</b> 8.30%
<b>10 years 2017</b> 5.53%	<b>10 years 2016</b> 4.99%	<b>10 years 2015</b> 5.74%
<b>5 years 2017</b> 10.16%	<b>5 years 2016</b> 9.37%	<b>5 years 2015</b> 7.73%

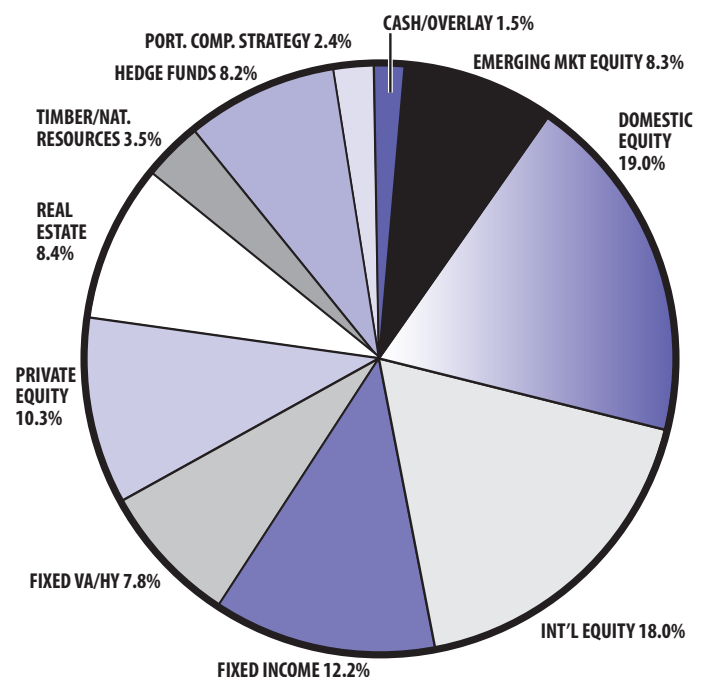
## ACTUARIAL

▶ Funded Ratio	26.2%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.65%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2034
▶ Unfunded Liability	\$827.4 M
▶ Total Pension Appropriation (Fiscal 2018)	\$57.7 M

	ACTIVE	RETIRED
▶ Number of Members	3,323	2,803
▶ Total Payroll/Benefit	\$152.2 M	\$69.4 M
▶ Average Salary/Benefit	\$45,800	\$24,700
▶ Average Age	46	73
▶ Average Service	12.1 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	445
▶ Number Who Reported Earnings	115
▶ Number of Excess Earners	6
▶ Total Amount of Refund Due	\$96,865.44

▶ 2017 Return	17.86%
▶ 2017 Market Value	\$342.6 M
▶ 2013-2017 (Annualized)	10.16%
▶ 1985-2017 (Annualized)	8.58%

## State

Boston Office  
One Winter Street, 8<sup>th</sup> floor  
Boston, MA 02108  
Phone 617-367-7770  
Fax 617-723-1438

## Board Members

Treasurer Deborah B. Goldberg (Chairperson),  
Patricia Deal, Archie Gormley,  
Theresa McGoldrick, Esq., Frank Valeri

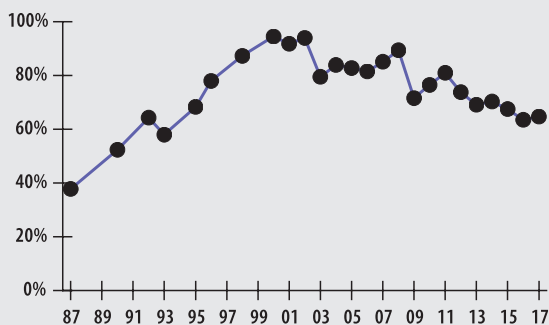
## Board Administrator

Nicola Favorito, Esq.

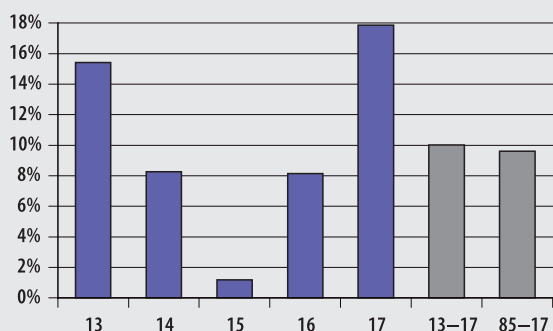
## Board Meeting

Last Thursday of each month

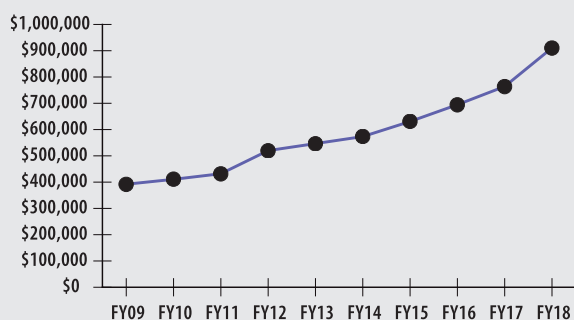
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.61%

#### 32 years 2016

9.36%

#### 31 years 2015

9.40%

#### 10 years 2017

5.68%

#### 10 years 2016

5.15%

#### 10 years 2015

5.97%

#### 5 years 2017

10.01%

#### 5 years 2016

9.28%

#### 5 years 2015

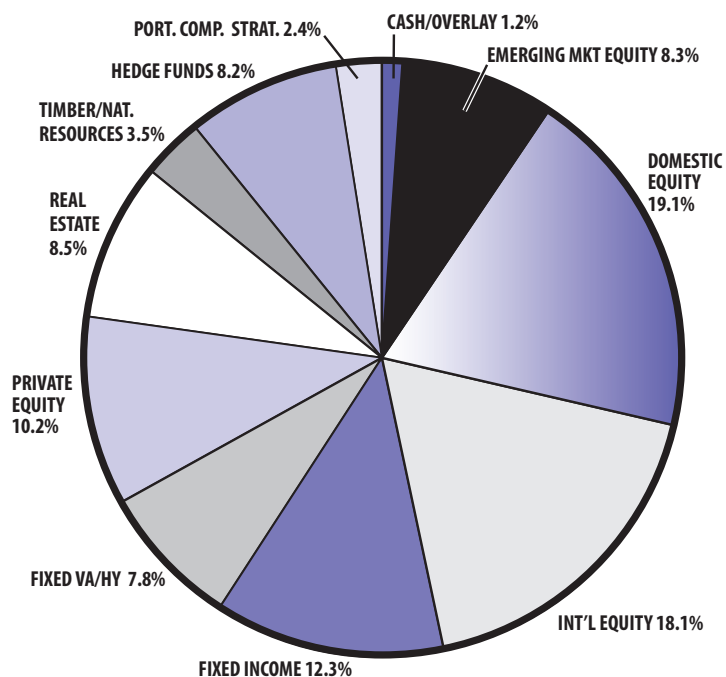
7.62%

## ACTUARIAL

▶ Funded Ratio	64.7%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	8.94% Total Increasing
▶ Year Fully Funded	2036
▶ Unfunded Liability	\$13.54 B
▶ Total Pension Appropriation (Fiscal 2018)	\$910.0 M

	ACTIVE	RETIRED
▶ Number of Members	90,014	62,259
▶ Total Payroll/Benefit	\$5.9 B	\$2.1 B
▶ Average Salary/Benefit	\$65,800	\$33,700
▶ Average Age	47	72
▶ Average Service	12.4 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	3889
▶ Number Who Reported Earnings	867
▶ Number of Excess Earners	12
▶ Total Amount of Refund Due	\$204,762.33

▶ 2017 Return	17.86%
▶ 2017 Market Value	\$27.6 B
▶ 2013-2017 (Annualized)	10.01%
▶ 1985-2017 (Annualized)	9.61%

## Stoneham

Town Hall  
35 Central Street  
Stoneham, MA 02180-2087  
Phone 781-279-2635  
Fax 781-438-6906

### Board Members

Janice T. Houghton (Chairperson),  
David Castellarin, James J. McDermott, Jr.,  
John Scullin, Kathleen Sullivan

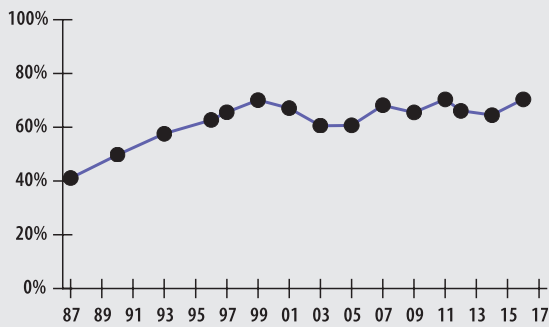
### Board Administrator

Karen DeAngelis

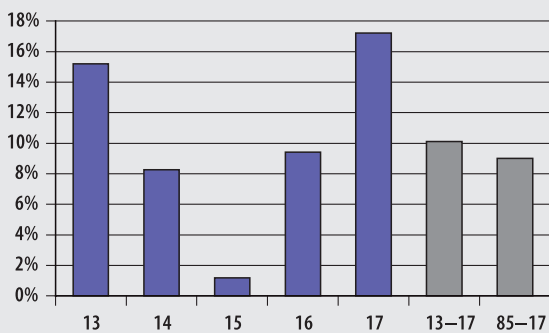
### Board Meeting

Last Tuesday of each month at 2:00 pm

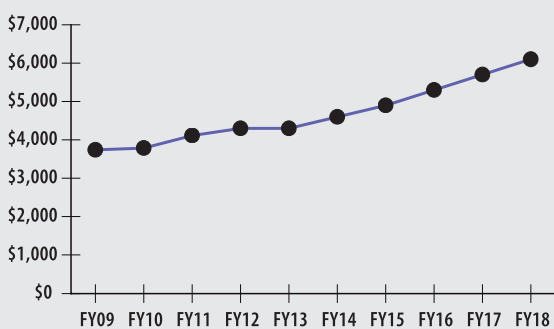
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 9.01%	<b>32 years 2016</b> 8.76%	<b>31 years 2015</b> 8.74%
<b>10 years 2017</b> 5.74%	<b>10 years 2016</b> 5.26%	<b>10 years 2015</b> 5.95%
<b>5 years 2017</b> 10.11%	<b>5 years 2016</b> 9.48%	<b>5 years 2015</b> 7.57%

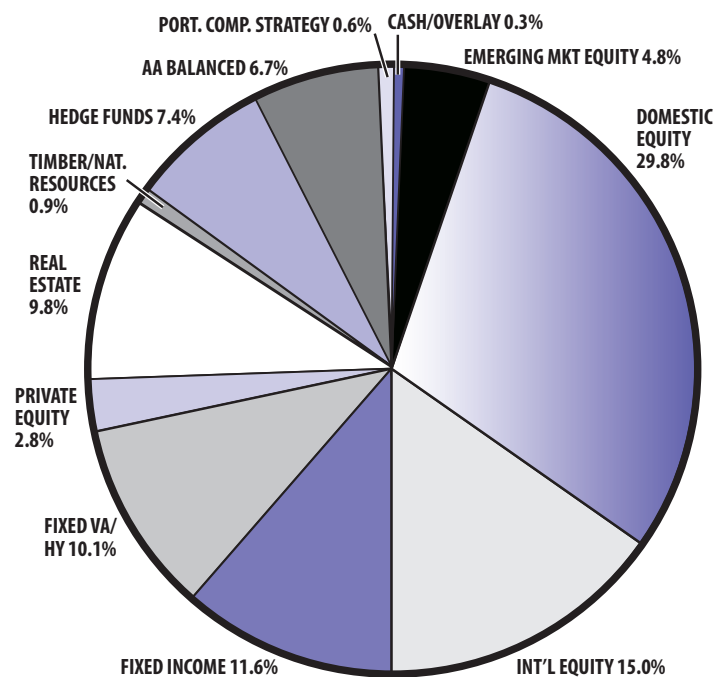
## ACTUARIAL

▶ Funded Ratio	70.4%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	7.85% Total Increasing
▶ Year Fully Funded	2024
▶ Unfunded Liability	\$32.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$6.1 M

	ACTIVE	RETIRED
▶ Number of Members	274	282
▶ Total Payroll/Benefit	\$13.8 M	\$7.0 M
▶ Average Salary/Benefit	\$50,200	\$24,800
▶ Average Age	50	76
▶ Average Service	13.2 years	NA

## ASSET ALLOCATION (12/31/17)



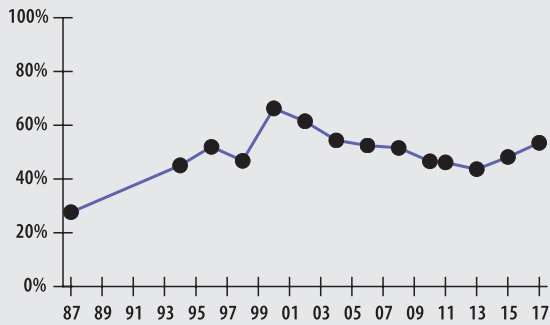
## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	21
▶ Number Who Reported Earnings	4
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

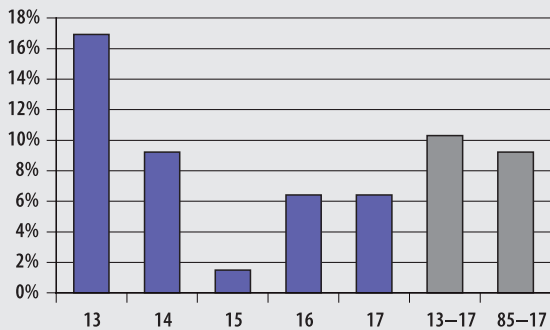
▶ 2017 Return	17.22%
▶ 2017 Market Value	\$92.5 M
▶ 2013-2017 (Annualized)	10.11%
▶ 1985-2017 (Annualized)	9.01%



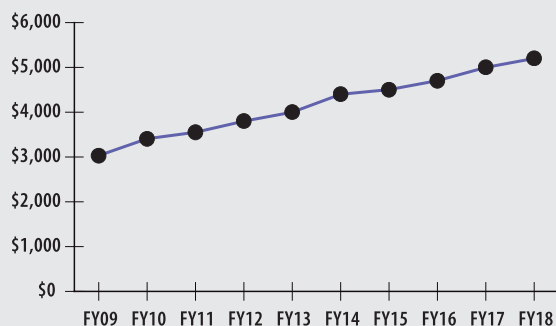
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 9.23%	<b>32 years 2016</b> 8.94%	<b>31 years 2015</b> 9.03%
<b>10 years 2017</b> 5.97%	<b>10 years 2016</b> 5.31%	<b>10 years 2015</b> 5.81%
<b>5 years 2017</b> 10.36%	<b>5 years 2016</b> 9.75%	<b>5 years 2015</b> 8.03%

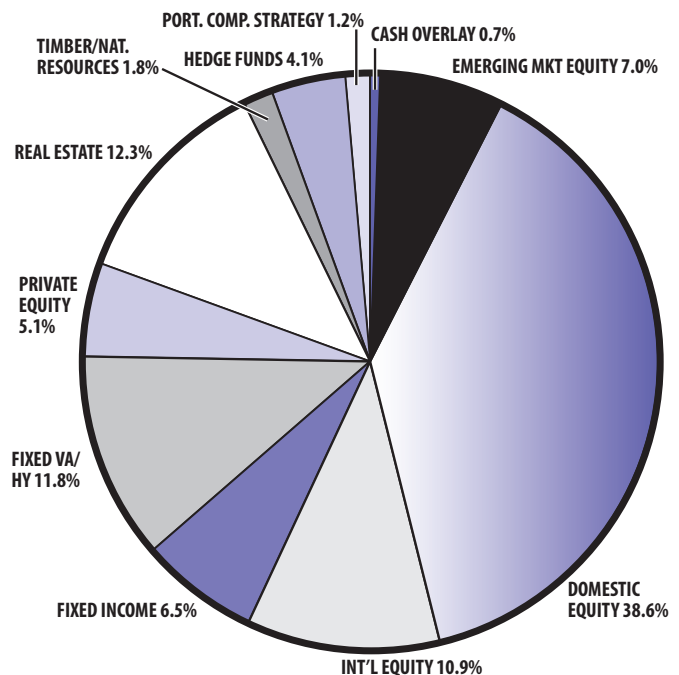
### ACTUARIAL

▶ Funded Ratio	53.5%
▶ Date of Last Valuation	01/17
▶ Actuary	Stone
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	2.9% Increasing
▶ Year Fully Funded	2031
▶ Unfunded Liability	\$44.4 M
▶ Total Pension Appropriation (Fiscal 2018)	\$5.2 M

	ACTIVE	RETIRED
▶ Number of Members	246	200
▶ Total Payroll/Benefit	\$13.1 M	\$5.2 M
▶ Average Salary/Benefit	\$53,200	\$26,200
▶ Average Age	50	74
▶ Average Service	13.7 years	NA

### ASSET ALLOCATION (12/31/17)



### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	26
▶ Number Who Reported Earnings	4
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	18.65%
▶ 2017 Market Value	\$58.3 M
▶ 2013-2017 (Annualized)	10.36%
▶ 1985-2017 (Annualized)	9.23%

**Board Members**

Ann Marie Hebert (Chairperson),  
Barry Amaral, Peter H. Corr, Gill E. Enos,  
Dennis M. Smith

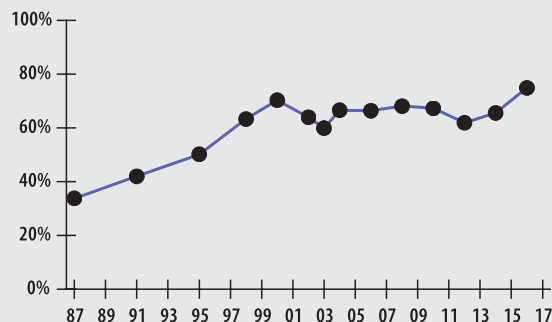
**Board Administrator**

Paul J. Slivinski

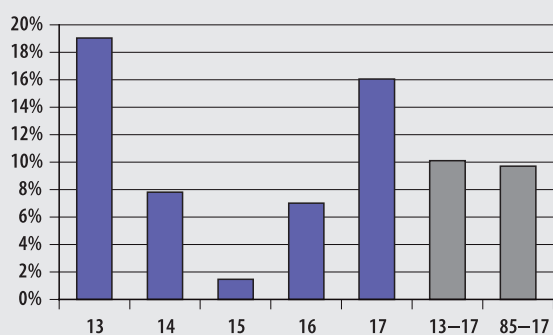
**Board Meeting**

Varies

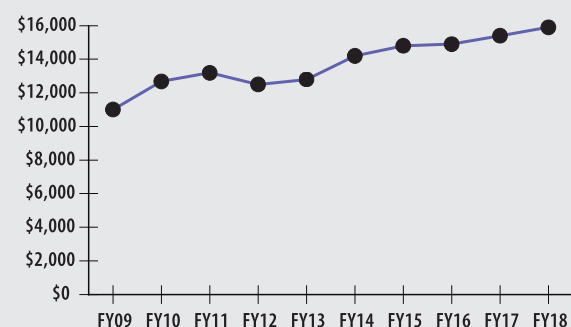
**FUNDED RATIO (1987-2017)**



**INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)**



**10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)**



**INVESTMENT RETURN HISTORY**

**33 years 2017**  
9.71%

**32 years 2016**  
9.51%

**31 years 2015**  
9.59%

**10 years 2017**  
6.71%

**10 years 2016**  
5.99%

**10 years 2015**  
6.55%

**5 years 2017**  
10.11%

**5 years 2016**  
9.37%

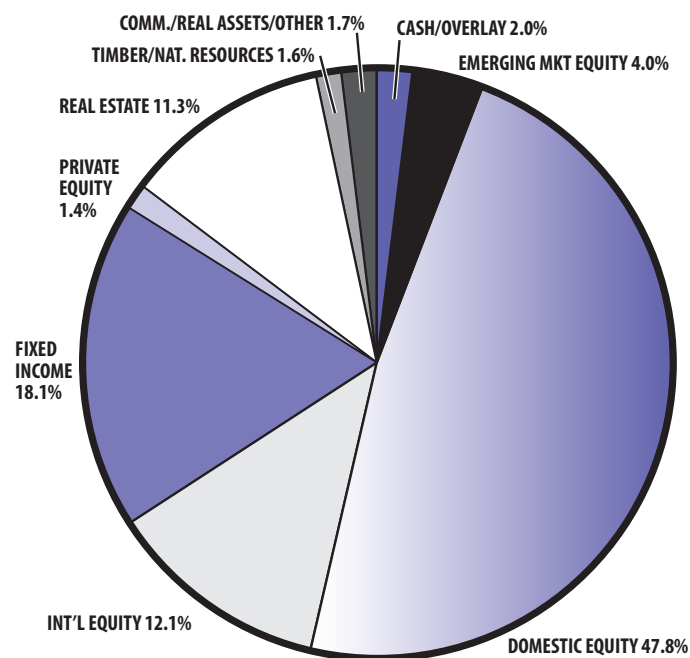
**5 years 2015**  
7.97%

**ACTUARIAL**

▶ Funded Ratio	74.9%
▶ Date of Last Valuation	01/16
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	3.0% Increasing
▶ Year Fully Funded	2026
▶ Unfunded Liability	\$93.3 M
▶ Total Pension Appropriation (Fiscal 2018)	\$15.9 M

	ACTIVE	RETIRED
▶ Number of Members	1,104	822
▶ Total Payroll/Benefit	\$59.2 M	\$22.3 M
▶ Average Salary/Benefit	\$53,600	\$27,100
▶ Average Age	NA	73
▶ Average Service	NA	NA

**ASSET ALLOCATION (12/31/17)**



**EARNED INCOME OF DISABILITY RETIREES (2016)**

▶ Number of Disability Retirees	89
▶ Number Who Reported Earnings	17
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	16.06%
▶ 2017 Market Value	\$314.0 M
▶ 2013-2017 (Annualized)	10.11%
▶ 1985-2017 (Annualized)	9.71%

## Wakefield

1 Lafayette Street  
Wakefield, MA 01880  
Phone 781-246-6352  
Fax 781-246-2400

### Board Members

Kevin Gill (Chairperson),  
Richard J. DeFelice, Philip Rogers, Sr.,  
Daniel Sherman, Richard Smith

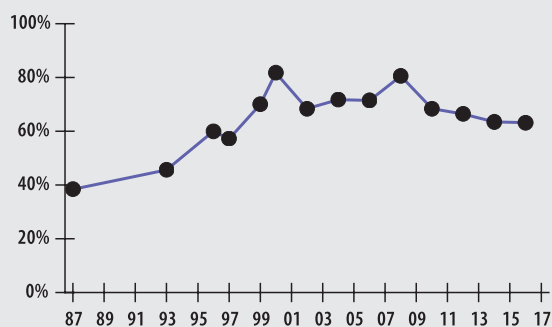
### Board Administrator

Cathy Cheek

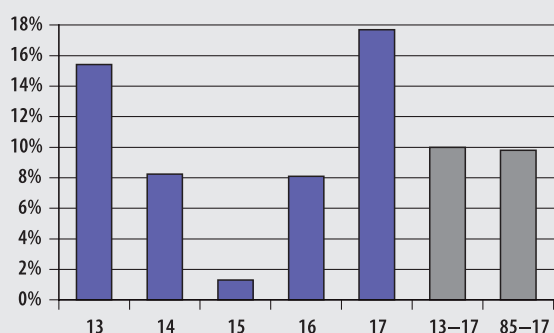
### Board Meeting

Third Thursday of each month

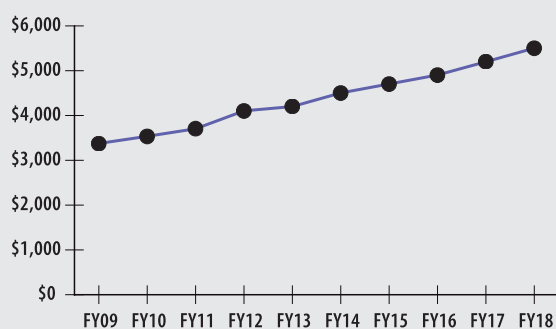
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
9.81%

**32 years 2016**  
9.57%

**31 years 2015**  
9.61%

**10 years 2017**  
5.68%

**10 years 2016**  
5.16%

**10 years 2015**  
5.98%

**5 years 2017**  
10.00%

**5 years 2016**  
9.29%

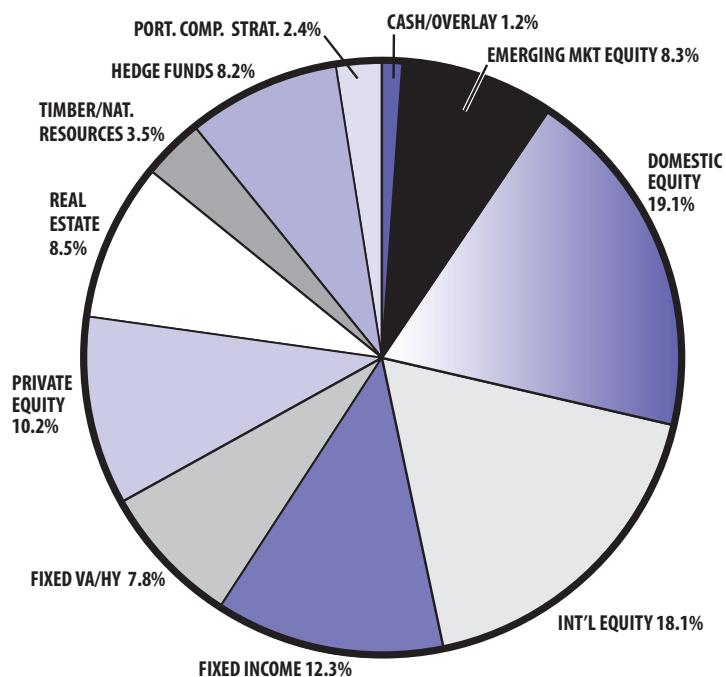
**5 years 2015**  
7.67%

## ACTUARIAL

▶ Funded Ratio	63.2%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	7.18% Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$60.9 M
▶ Total Pension Appropriation (Fiscal 2018)	\$5.5 M

	ACTIVE	RETIRED
▶ Number of Members	458	361
▶ Total Payroll/Benefit	\$25.1 M	\$9.7 M
▶ Average Salary/Benefit	\$54,700	\$26,800
▶ Average Age	48	74
▶ Average Service	11.9 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	40
▶ Number Who Reported Earnings	5
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.71%
▶ 2017 Market Value	\$123.3 M
▶ 2013-2017 (Annualized)	10.00%
▶ 1985-2017 (Annualized)	9.81%

## Waltham

610 Main Street  
Waltham, MA 02452  
Phone 781-314-3230  
Fax 781-314-3236

### Board Members

William R. MacDonald (Chairperson),  
Elizabeth Arnold, Paul G. Centofanti,  
Scott Hovsepian, Mary Rosen

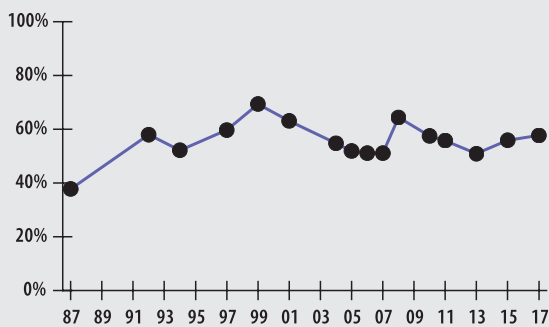
### Board Administrator

Karen Doucet

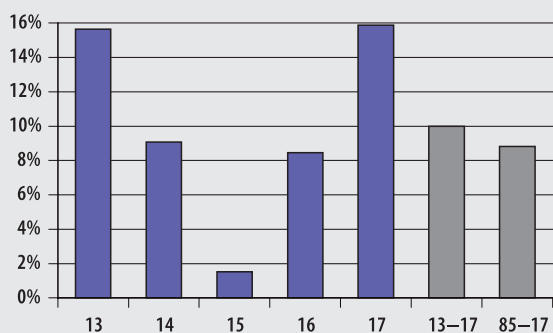
### Board Meeting

Varies

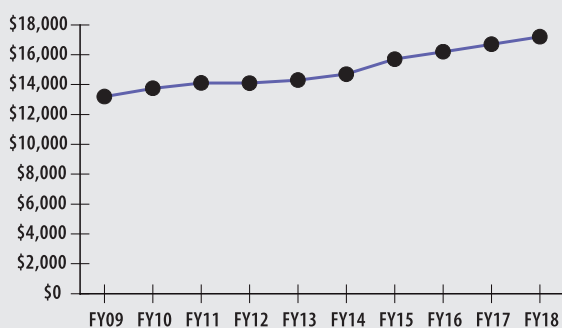
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.83%

**32 years 2016**  
8.61%

**31 years 2015**  
8.62%

**10 years 2017**  
5.70%

**10 years 2016**  
5.07%

**10 years 2015**  
5.59%

**5 years 2017**  
9.99%

**5 years 2016**  
9.66%

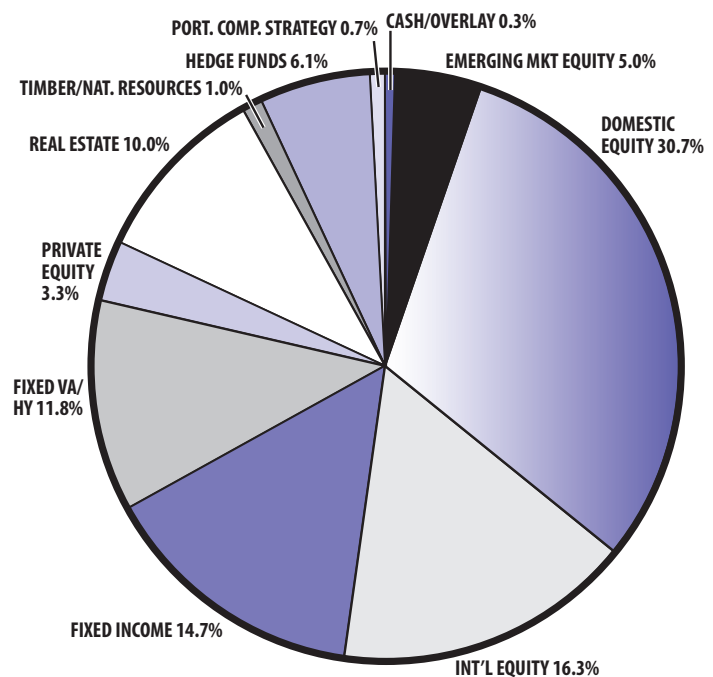
**5 years 2015**  
8.23%

## ACTUARIAL

▶ Funded Ratio	57.7%
▶ Date of Last Valuation	01/17
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2032
▶ Unfunded Liability	\$164.2 M
▶ Total Pension Appropriation (Fiscal 2018)	\$17.2 M

	ACTIVE	RETIRED
▶ Number of Members	910	766
▶ Total Payroll/Benefit	\$61.6 M	\$23.7 M
▶ Average Salary/Benefit	\$67,700	\$30,900
▶ Average Age	NA	74
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	96
▶ Number Who Reported Earnings	15
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	15.89%
▶ 2017 Market Value	\$248.3 M
▶ 2013-2017 (Annualized)	9.99%
▶ 1985-2017 (Annualized)	8.83%

## Watertown

P. O. Box 199, 149 Main Street  
Watertown, MA 02471-0199  
Phone 617-972-6456,  
888-972-6456 (toll free)  
Fax 617-923-3531

### Board Members

Thomas V. Thibaut, Jr. (Chairperson),  
Domenic D. Arone, Kathleen Kiely-Becchetti,  
John T. Loughran, Thomas J. Tracy

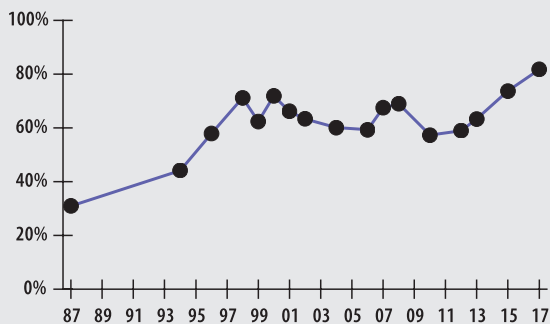
### Board Administrator

Barbara A. Sheehan

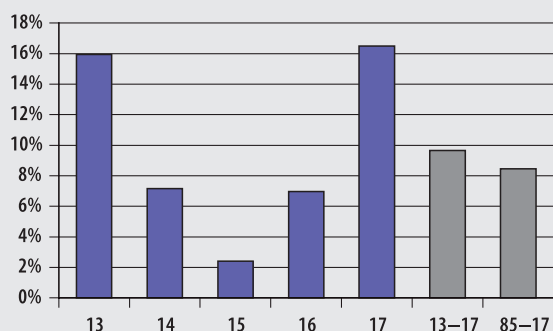
### Board Meeting

Varies

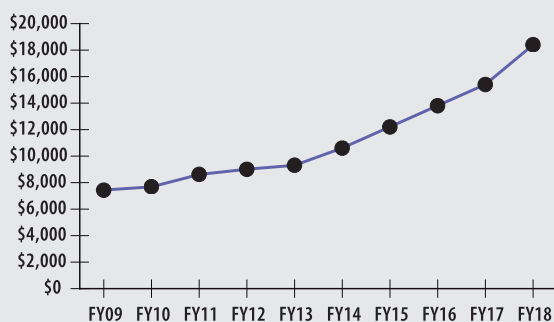
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

8.46%

#### 32 years 2016

8.22%

#### 31 years 2015

8.26%

#### 10 years 2017

5.78%

#### 10 years 2016

4.96%

#### 10 years 2015

5.77%

#### 5 years 2017

9.66%

#### 5 years 2016

8.99%

#### 5 years 2015

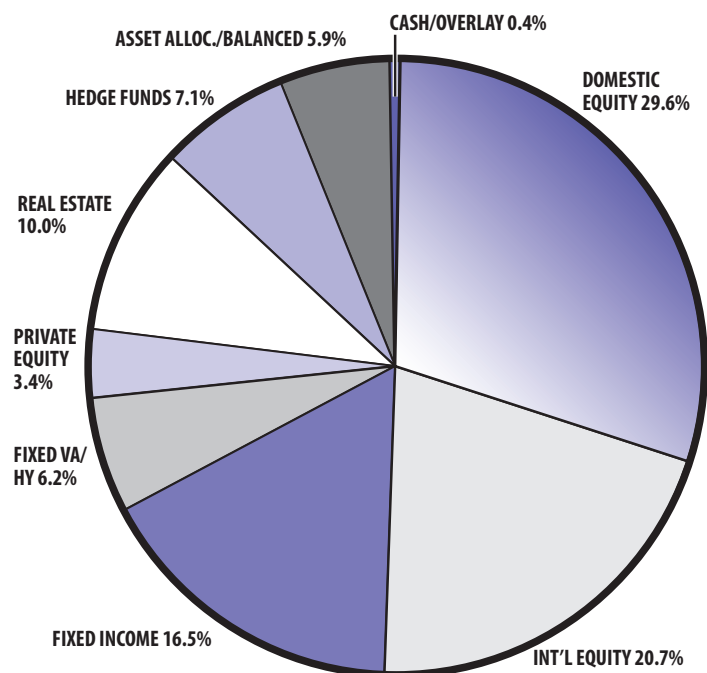
7.45%

## ACTUARIAL

▶ Funded Ratio	81.8%
▶ Date of Last Valuation	01/17
▶ Actuary	Sherman
▶ Assumed Rate of Return	7.90%
▶ Funding Schedule	Varies Total Increasing
▶ Year Fully Funded	2020
▶ Unfunded Liability	\$36.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$18.4 M

	ACTIVE	RETIRED
▶ Number of Members	556	429
▶ Total Payroll/Benefit	\$35.2 M	\$13.0 M
▶ Average Salary/Benefit	\$63,300	\$30,300
▶ Average Age	NA	75
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)

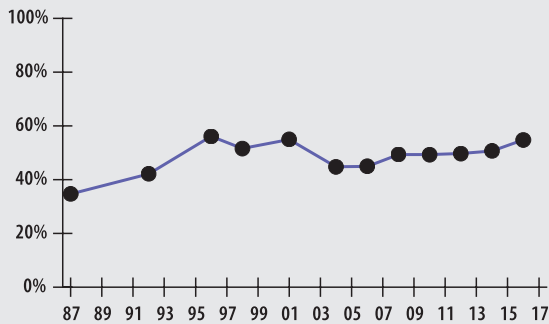


## EARNED INCOME OF DISABILITY RETIREES (2016)

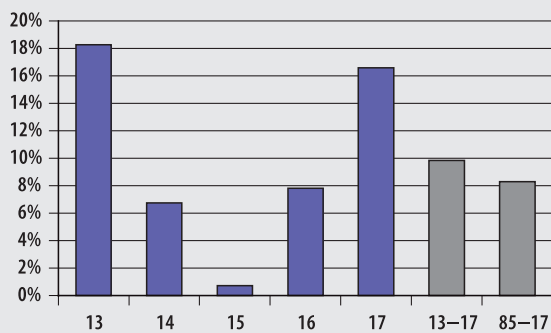
▶ Number of Disability Retirees	59
▶ Number Who Reported Earnings	10
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	16.51%
▶ 2017 Market Value	\$185.2 M
▶ 2013-2017 (Annualized)	9.66%
▶ 1985-2017 (Annualized)	8.46%

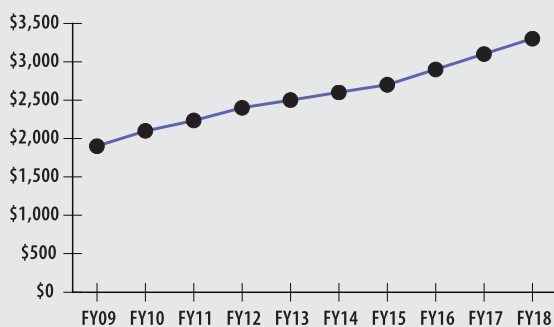
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

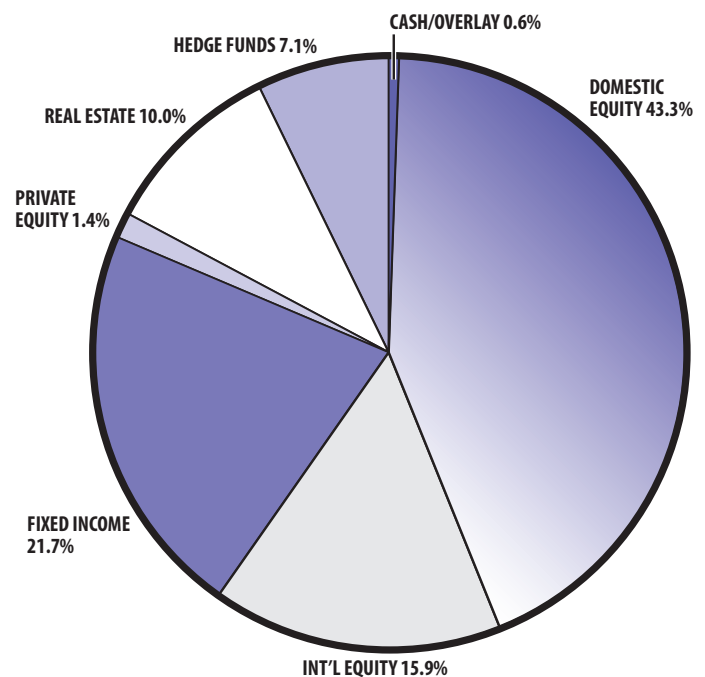
<b>33 years 2017</b> 8.31%	<b>32 years 2016</b> 8.06%	<b>31 years 2015</b> 8.07%
<b>10 years 2017</b> 6.45%	<b>10 years 2016</b> 5.66%	<b>10 years 2015</b> 6.12%
<b>5 years 2017</b> 9.85%	<b>5 years 2016</b> 9.32%	<b>5 years 2015</b> 7.72%

### ACTUARIAL

▶ Funded Ratio	54.8%
▶ Date of Last Valuation	01/16
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	6.0% Total Increasing
▶ Year Fully Funded	2031
▶ Unfunded Liability	\$26.6 M
▶ Total Pension Appropriation (Fiscal 2018)	\$3.3 M

	ACTIVE	RETIRED
▶ Number of Members	255	136
▶ Total Payroll/Benefit	\$10.6 M	\$3.0 M
▶ Average Salary/Benefit	\$41,500	\$22,200
▶ Average Age	46	73
▶ Average Service	10.6 years	NA

### ASSET ALLOCATION (12/31/17)

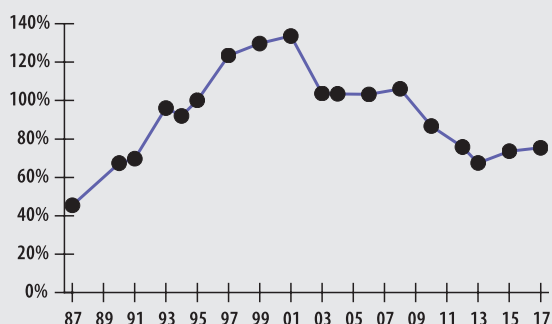


### EARNED INCOME OF DISABILITY RETIREES (2016)

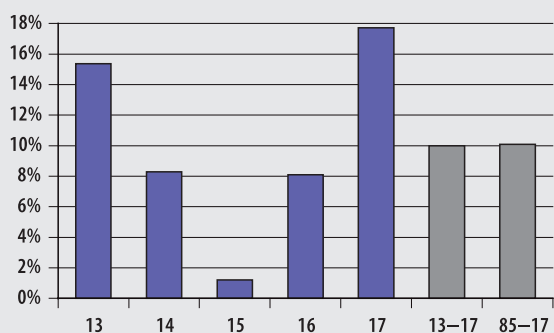
▶ Number of Disability Retirees	9
▶ Number Who Reported Earnings	1
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	16.61%
▶ 2017 Market Value	\$39.1 M
▶ 2013-2017 (Annualized)	9.85%
▶ 1985-2017 (Annualized)	8.31%

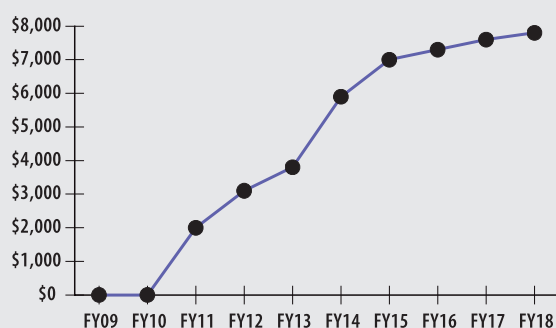
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

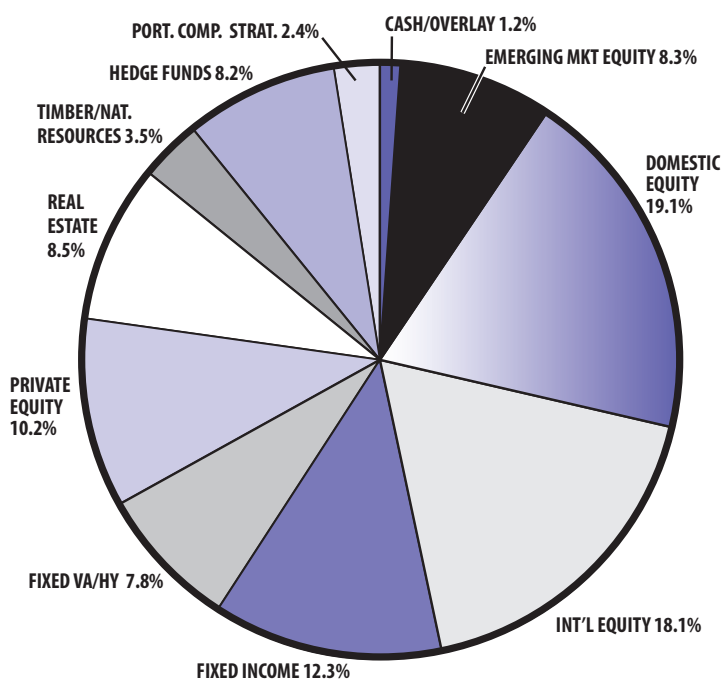
<b>33 years 2017</b>	<b>32 years 2016</b>	<b>31 years 2015</b>
10.09%	9.86%	9.92%
<b>10 years 2017</b>	<b>10 years 2016</b>	<b>10 years 2015</b>
5.69%	4.82%	5.58%
<b>5 years 2017</b>	<b>5 years 2016</b>	<b>5 years 2015</b>
9.99%	9.27%	7.63%

### ACTUARIAL

▶ Funded Ratio	75.4%
▶ Date of Last Valuation	01/17
▶ Actuary	Segal
▶ Assumed Rate of Return	6.63%
▶ Funding Schedule	3.5% Increasing
▶ Year Fully Funded	2030
▶ Unfunded Liability	\$55.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$7.8 M

	ACTIVE	RETIRED
▶ Number of Members	702	403
▶ Total Payroll/Benefit	\$38.2 M	\$10.8 M
▶ Average Salary/Benefit	\$54,500	\$26,900
▶ Average Age	46	NA
▶ Average Service	10.7 years	NA

### ASSET ALLOCATION (12/31/17)



### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	35
▶ Number Who Reported Earnings	9
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.73%
▶ 2017 Market Value	\$192.1 M
▶ 2013-2017 (Annualized)	9.99%
▶ 1985-2017 (Annualized)	10.09%

## West Springfield

26 Central Street  
Suite 26  
West Springfield, MA 01089-2766  
Phone 413-495-1891 x.1019  
Fax 413-263-3198

### Board Members

Sharon Wilcox (Chairperson),  
Gerard P. Connor, Jr., Thomas J. Cummings,  
Gwen E. Keough, Daniel Marini

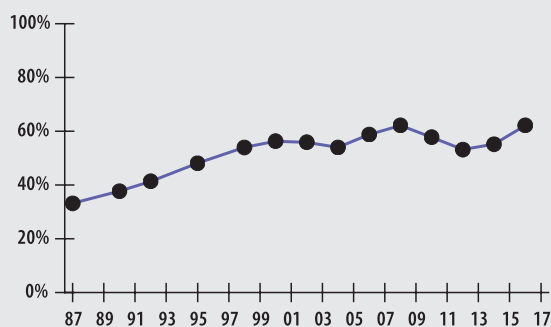
### Board Administrator

James Lovotti

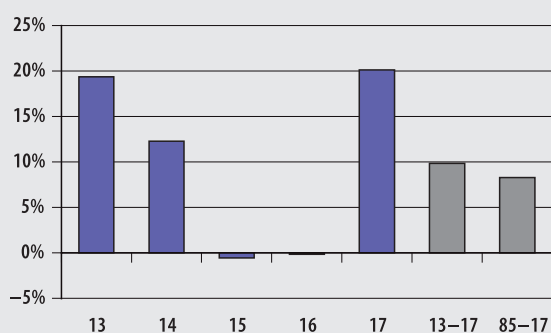
### Board Meeting

Varies

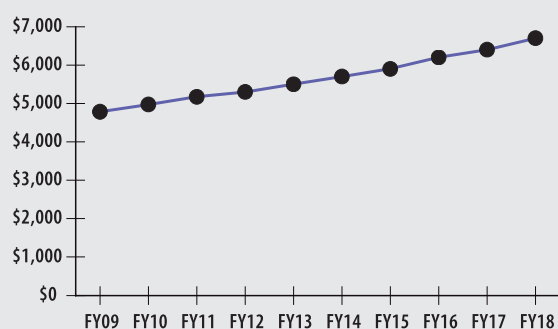
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.29%

**32 years 2016**  
7.94%

**31 years 2015**  
8.21%

**10 years 2017**  
6.25%

**10 years 2016**  
5.26%

**10 years 2015**  
6.11%

**5 years 2017**  
9.85%

**5 years 2016**  
8.06%

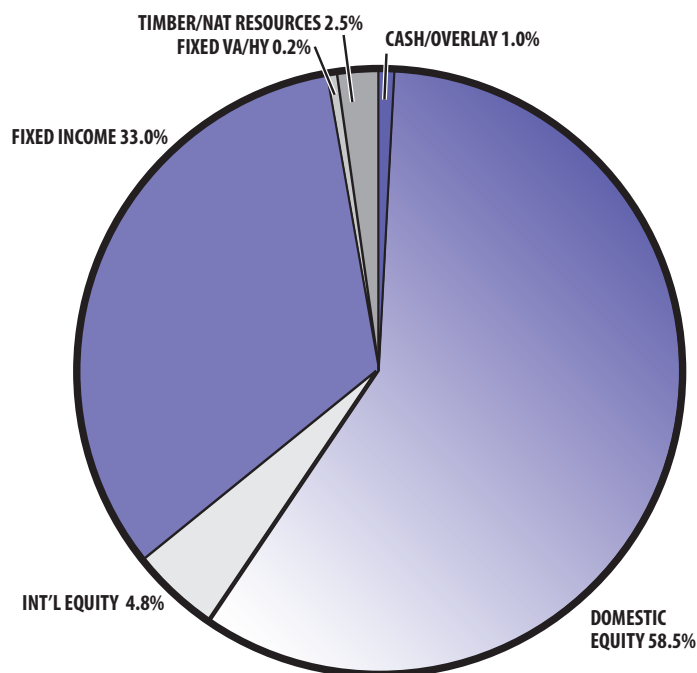
**5 years 2015**  
8.88%

## ACTUARIAL

▶ Funded Ratio	62.2%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.13% Total Increasing
▶ Year Fully Funded	2034
▶ Unfunded Liability	\$63.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$6.7 M

	ACTIVE	RETIRED
▶ Number of Members	592	385
▶ Total Payroll/Benefit	\$25.1 M	\$8.8 M
▶ Average Salary/Benefit	\$42,500	\$22,700
▶ Average Age	48	73
▶ Average Service	12.4 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	39
▶ Number Who Reported Earnings	12
▶ Number of Excess Earners	1
▶ Total Amount of Refund Due	\$50,593.80

▶ 2017 Return	20.15%
▶ 2017 Market Value	\$115.8 M
▶ 2013-2017 (Annualized)	9.85%
▶ 1985-2017 (Annualized)	8.29%



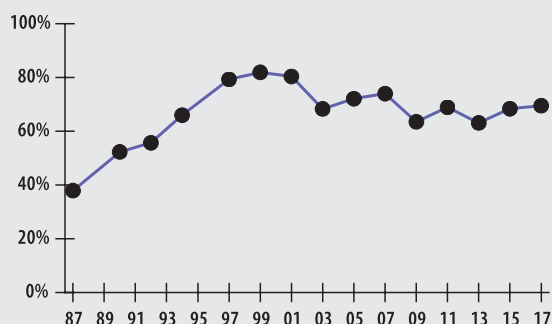
## Westfield

59 Court Street  
P. O. Box 106  
Westfield, MA 01086-0106  
Phone 413-572-6239  
Fax 413-642-9410

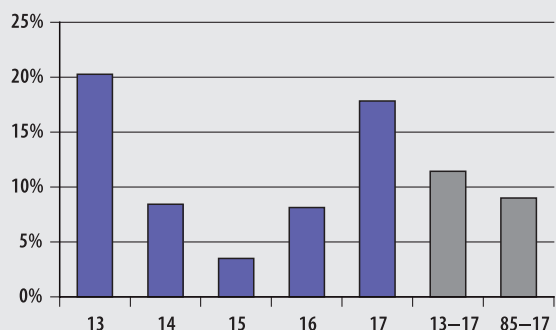
**Board Members**  
Mark Devine (Chairperson),  
Mary Daley, Brian Fanion,  
Christopher Kane, Michael J. Powers

**Board Administrator**  
Lynn E. Rea  
**Board Meeting**  
Third Thursday of each month at 3:00 pm

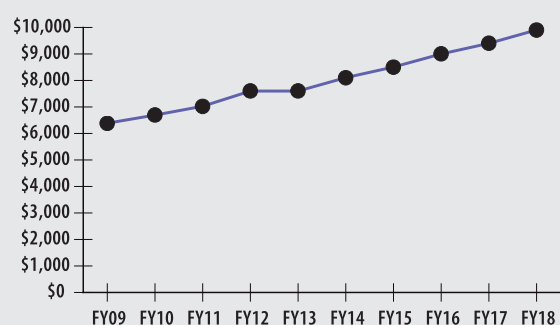
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
9.02%

**32 years 2016**  
8.75%

**31 years 2015**  
8.77%

**10 years 2017**  
7.36%

**10 years 2016**  
6.34%

**10 years 2015**  
6.67%

**5 years 2017**  
11.46%

**5 years 2016**  
10.93%

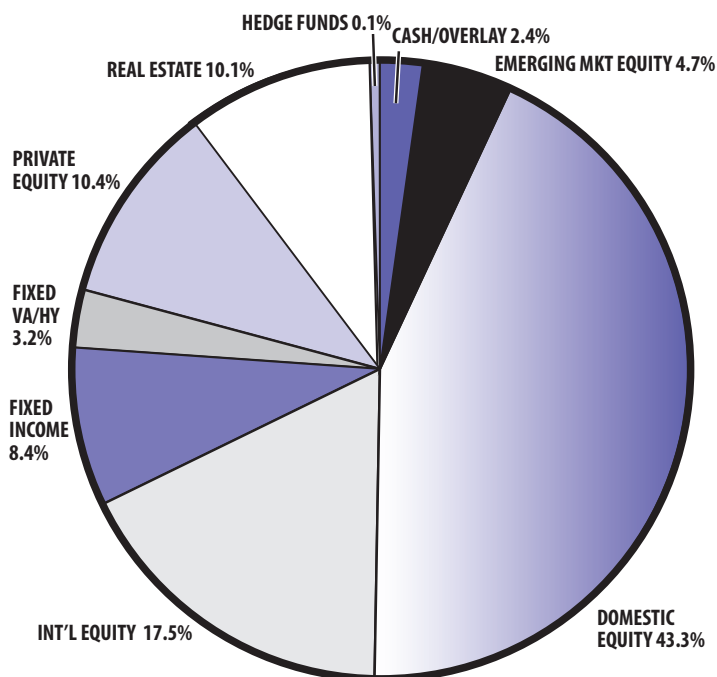
**5 years 2015**  
9.27%

## ACTUARIAL

▶ Funded Ratio	69.5%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.50%
▶ Funding Schedule	5.8% Total Increasing
▶ Year Fully Funded	2034
▶ Unfunded Liability	\$91.0 M
▶ Total Pension Appropriation (Fiscal 2018)	\$9.9 M

	ACTIVE	RETIRED
▶ Number of Members	895	663
▶ Total Payroll/Benefit	\$40.8 M	\$17.2 M
▶ Average Salary/Benefit	\$45,500	\$26,000
▶ Average Age	47	72
▶ Average Service	11.8 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	63
▶ Number Who Reported Earnings	14
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.85%
▶ 2017 Market Value	\$237.2 M
▶ 2013-2017 (Annualized)	11.46%
▶ 1985-2017 (Annualized)	9.02%

## Weymouth

807 Broad Street  
Weymouth, MA 02189  
Phone 781-331-8721  
Fax 781-331-3005

### Board Members

Edward J. Masterson (Chairperson),  
Patrice A. Cook, Joseph L. Davis,  
Greg Hargadon, Richard Hayes

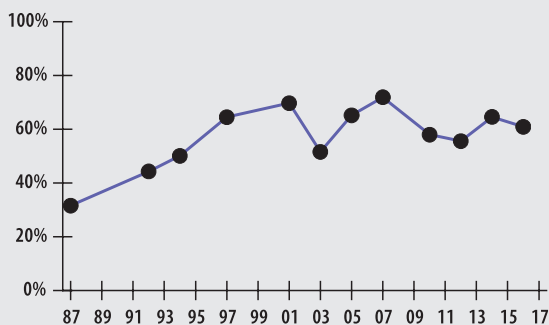
### Board Administrator

Jo-Ann Anti

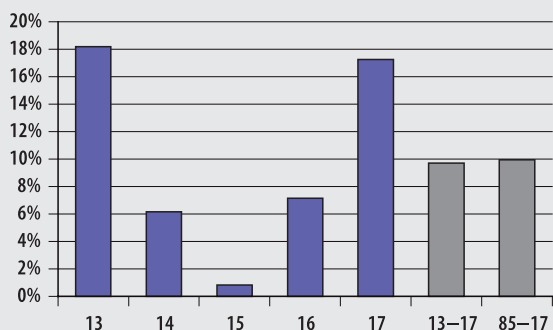
### Board Meeting

Third Monday of each month,  
unless otherwise posted

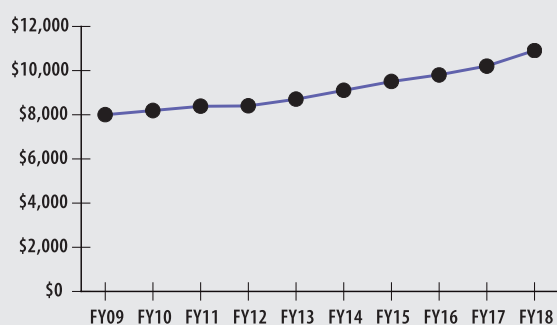
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.95%

#### 32 years 2016

9.73%

#### 31 years 2015

9.81%

#### 10 years 2017

6.11%

#### 10 years 2016

5.19%

#### 10 years 2015

6.01%

#### 5 years 2017

9.73%

#### 5 years 2016

9.28%

#### 5 years 2015

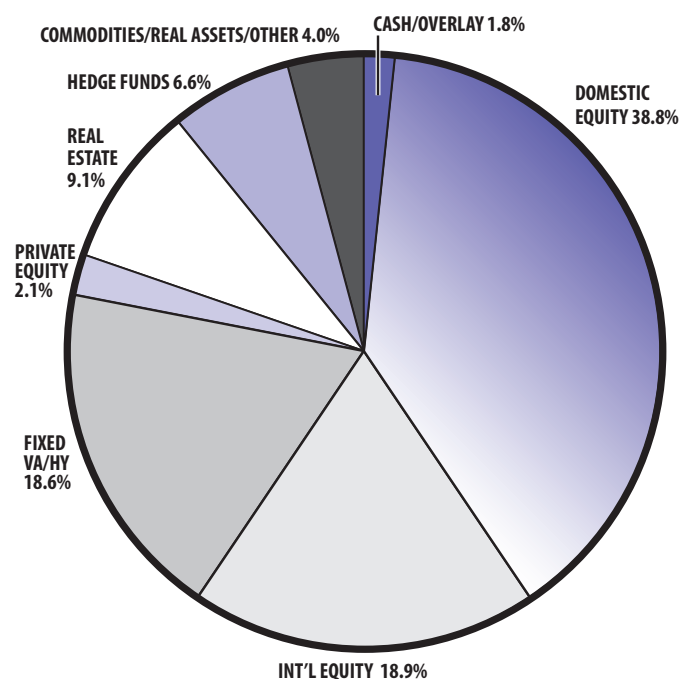
7.45%

## ACTUARIAL

▶ Funded Ratio	60.9%
▶ Date of Last Valuation	01/16
▶ Actuary	Stone
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	3.6% Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$108.1 M
▶ Total Pension Appropriation (Fiscal 2018)	\$10.9 M

	ACTIVE	RETIRED
▶ Number of Members	840	621
▶ Total Payroll/Benefit	\$38.3 M	\$17.1 M
▶ Average Salary/Benefit	\$45,600	\$27,500
▶ Average Age	49	74
▶ Average Service	11.5 years	NA

## ASSET ALLOCATION (12/31/17)

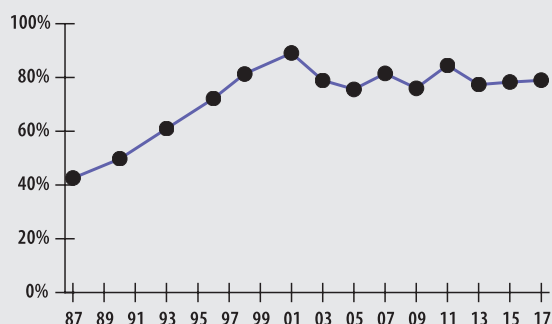


## EARNED INCOME OF DISABILITY RETIREES (2016)

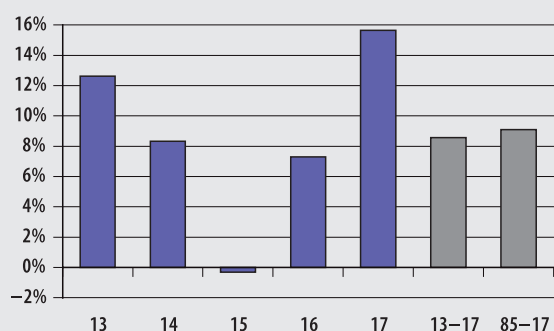
▶ Number of Disability Retirees	994
▶ Number Who Reported Earnings	27
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.27%
▶ 2017 Market Value	\$199.8 M
▶ 2013-2017 (Annualized)	9.73%
▶ 1985-2017 (Annualized)	9.95%

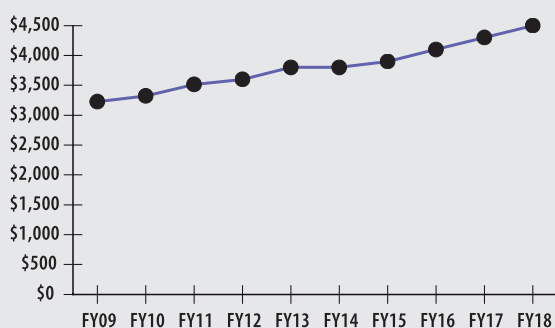
## FUNDED RATIO (1987-2017)



## INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



## 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



## INVESTMENT RETURN HISTORY

**33 years 2017**  
9.10%

**32 years 2016**  
8.90%

**31 years 2015**  
8.95%

**10 years 2017**  
4.87%

**10 years 2016**  
4.45%

**10 years 2015**  
5.18%

**5 years 2017**  
8.58%

**5 years 2016**  
7.70%

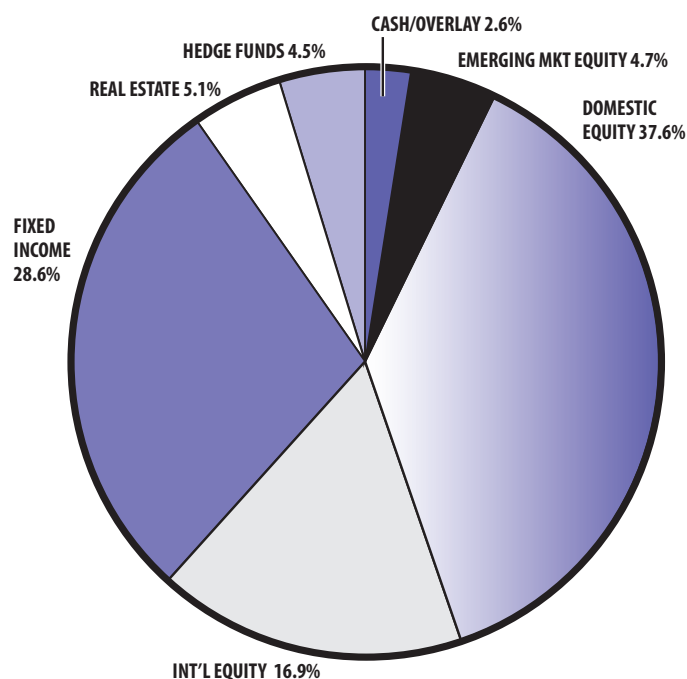
**5 years 2015**  
6.29%

## ACTUARIAL

▶ Funded Ratio	79.0%
▶ Date of Last Valuation	01/17
▶ Actuary	PERAC
▶ Assumed Rate of Return	7.00%
▶ Funding Schedule	7.1% total increasing
▶ Year Fully Funded	2029
▶ Unfunded Liability	\$29.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$4.5 M

	ACTIVE	RETIRED
▶ Number of Members	363	273
▶ Total Payroll/Benefit	\$19.7 M	\$7.3 M
▶ Average Salary/Benefit	\$54,400	\$26,800
▶ Average Age	49	76
▶ Average Service	13.6 years	NA

## ASSET ALLOCATION (12/31/17)

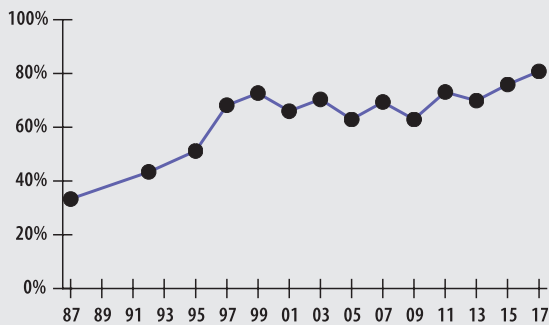


## EARNED INCOME OF DISABILITY RETIREES (2016)

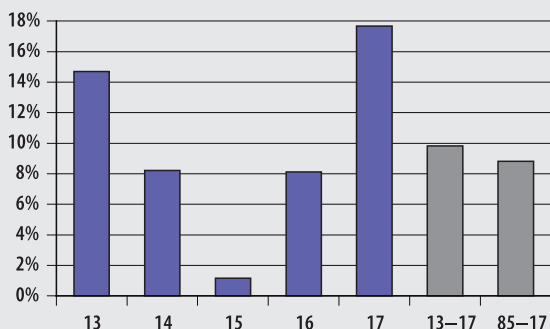
▶ Number of Disability Retirees	27
▶ Number Who Reported Earnings	3
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	15.64%
▶ 2017 Market Value	\$123.3 M
▶ 2013-2017 (Annualized)	8.58%
▶ 1985-2017 (Annualized)	9.10%

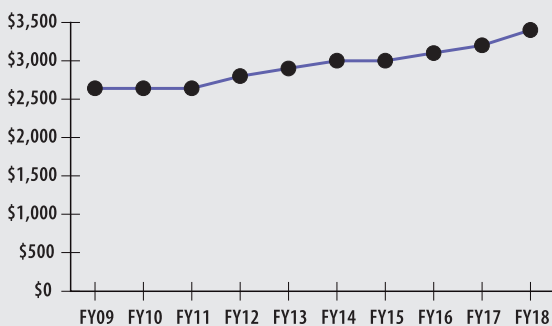
## FUNDED RATIO (1987-2017)



## INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



## 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



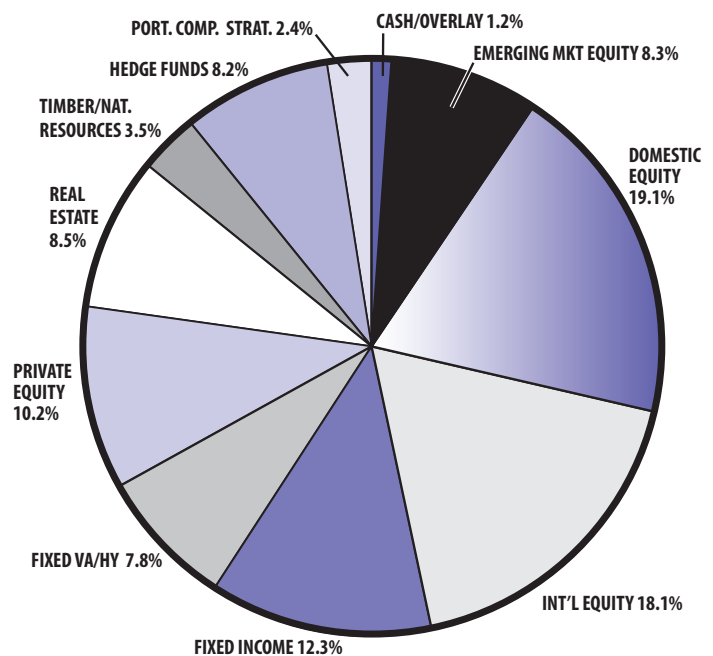
## INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 8.83%	<b>32 years 2016</b> 8.56%	<b>31 years 2015</b> 8.58%
<b>10 years 2017</b> 5.53%	<b>10 years 2016</b> 4.99%	<b>10 years 2015</b> 5.71%
<b>5 years 2017</b> 9.83%	<b>5 years 2016</b> 8.88%	<b>5 years 2015</b> 7.24%

## ACTUARIAL

▶ Funded Ratio		80.8%
▶ Date of Last Valuation		01/17
▶ Actuary		PERAC
▶ Assumed Rate of Return		7.25%
▶ Funding Schedule		4.0% Total Increasing
▶ Year Fully Funded		2028
▶ Unfunded Liability		\$14.5 M
▶ Total Pension Appropriation (Fiscal 2018)		\$3.4 M
	<b>ACTIVE</b>	<b>RETIRED</b>
▶ Number of Members	267	182
▶ Total Payroll/Benefit	\$12.9 M	\$3.5 M
▶ Average Salary/Benefit	\$48,100	\$19,400
▶ Average Age	50	75
▶ Average Service	12.6 years	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	16
▶ Number Who Reported Earnings	1
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.68%
▶ 2017 Market Value	\$70.6 M
▶ 2013-2017 (Annualized)	9.83%
▶ 1985-2017 (Annualized)	8.83%

## Woburn

City Hall, Second Floor  
10 Common Street  
Woburn, MA 01801-4139  
Phone 781-897-5820  
Fax 781-897-5824

### Board Members

Denis P. Devine (Chairperson),  
Charles E. Doherty, Michael J. Gorman,  
Marilou E. Lundin, Gerald W. Surette

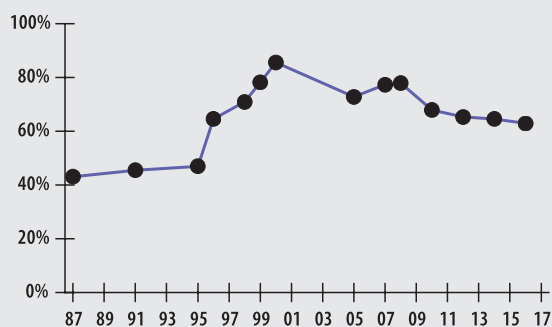
### Board Administrator

Maureen T. Marcucci

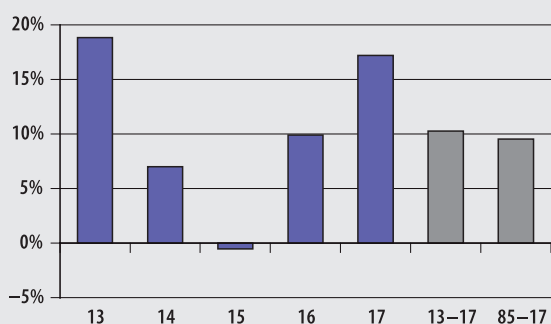
### Board Meeting

Varies

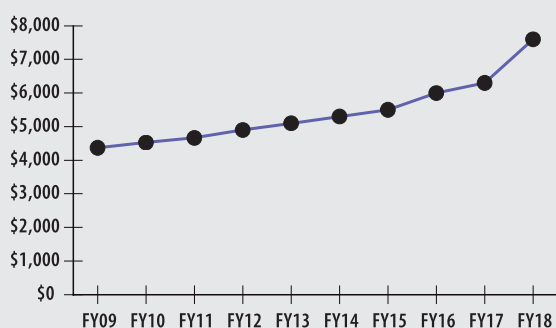
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.54%

#### 32 years 2016

9.31%

#### 31 years 2015

9.29%

#### 10 years 2017

6.70%

#### 10 years 2016

6.08%

#### 10 years 2015

6.43%

#### 5 years 2017

10.27%

#### 5 years 2016

9.63%

#### 5 years 2015

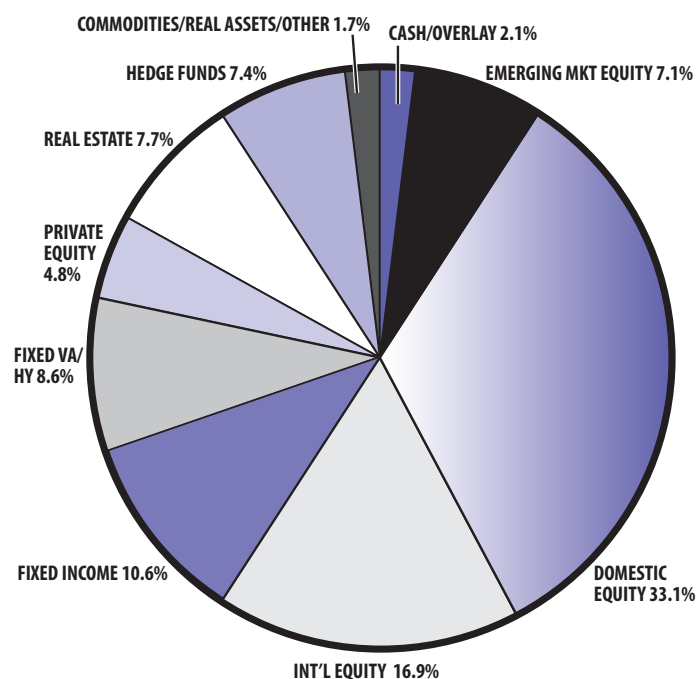
7.71%

## ACTUARIAL

▶ Funded Ratio	62.9%
▶ Date of Last Valuation	01/16
▶ Actuary	Conduent
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	4.0% Increasing Phase-In
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$76.2 M
▶ Total Pension Appropriation (Fiscal 2018)	\$7.6 M

	ACTIVE	RETIRED
▶ Number of Members	573	432
▶ Total Payroll/Benefit	\$29.2 M	\$11.1 M
▶ Average Salary/Benefit	\$50,900	\$25,700
▶ Average Age	NA	74
▶ Average Service	NA	NA

## ASSET ALLOCATION (12/31/17)



## EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	32
▶ Number Who Reported Earnings	9
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.23%
▶ 2017 Market Value	\$148.6 M
▶ 2013-2017 (Annualized)	10.27%
▶ 1985-2017 (Annualized)	9.54%

## Worcester

City Hall, Room 103  
455 Main Street  
Worcester, MA 01608  
Phone 508-799-1062  
Fax 508-799-1047

### Board Members

Stephen F. Wentzell (Chairperson),  
Elizabeth A. Early, John F. Mahan,  
Robert V. Stearns, Thomas M. Wade

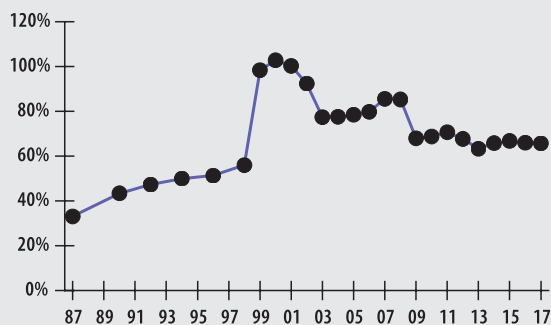
### Board Administrator

Elizabeth A. Early

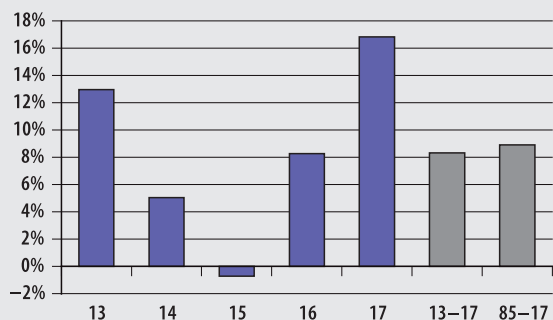
### Board Meeting

Second and Third Thursday of each month

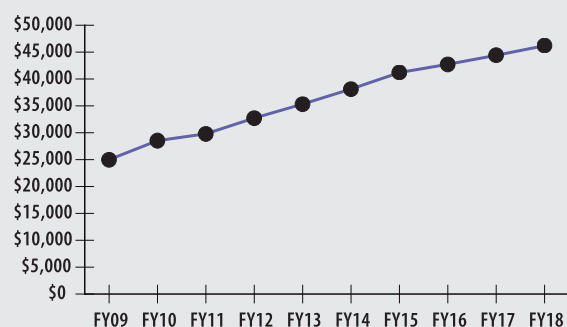
### FUNDED RATIO (1987-2017)



### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



### INVESTMENT RETURN HISTORY

**33 years 2017**  
8.93%

**32 years 2016**  
8.69%

**31 years 2015**  
8.71%

**10 years 2017**  
5.38%

**10 years 2016**  
4.66%

**10 years 2015**  
5.30%

**5 years 2017**  
8.32%

**5 years 2016**  
7.85%

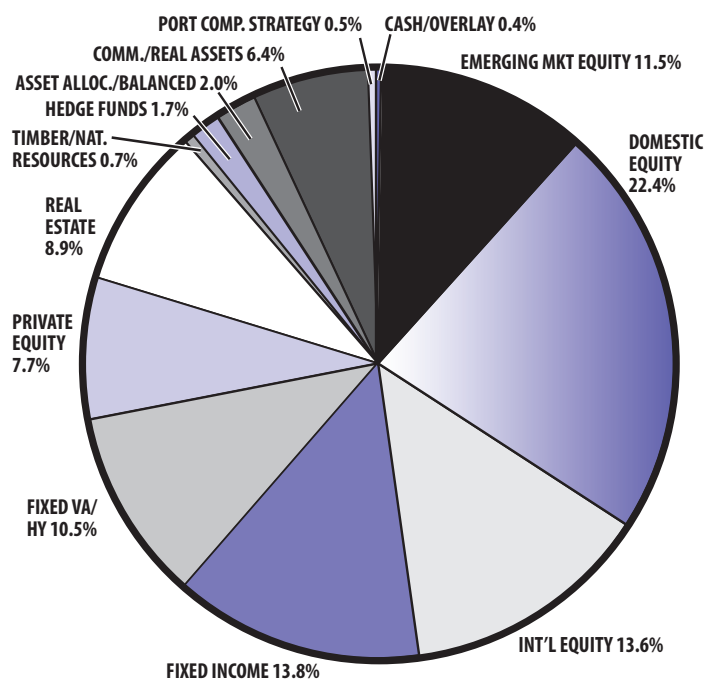
**5 years 2015**  
6.06%

## ACTUARIAL

▶ Funded Ratio	65.7%
▶ Date of Last Valuation	01/17
▶ Actuary	Segal
▶ Assumed Rate of Return	7.38%
▶ Funding Schedule	6.30% Total Increasing
▶ Year Fully Funded	2033
▶ Unfunded Liability	\$461.7 M
▶ Total Pension Appropriation (Fiscal 2018)	\$46.2 M

	ACTIVE	RETIRED
▶ Number of Members	3,342	2,728
▶ Total Payroll/Benefit	\$182.8 M	\$78.2 M
▶ Average Salary/Benefit	\$54,700	\$28,700
▶ Average Age	46	NA
▶ Average Service	13.1 years	NA

## ASSET ALLOCATION (12/31/17)

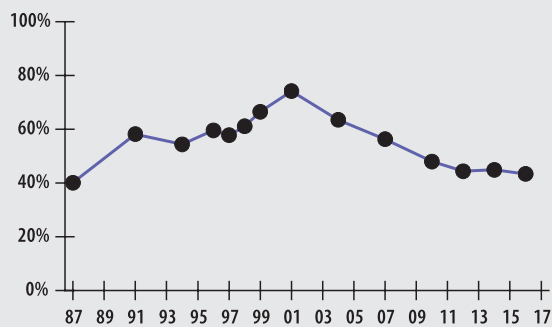


## EARNED INCOME OF DISABILITY RETIREES (2016)

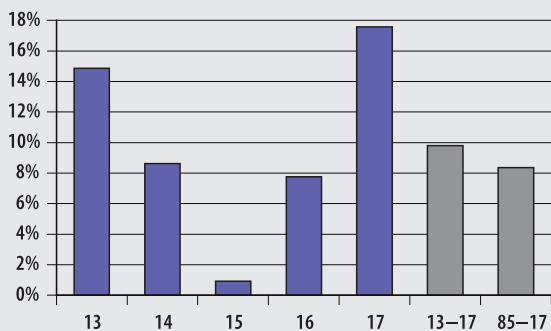
▶ Number of Disability Retirees	422
▶ Number Who Reported Earnings	73
▶ Number of Excess Earners	2
▶ Total Amount of Refund Due	\$38,649.27

▶ 2017 Return	16.84%
▶ 2017 Market Value	\$956.5 M
▶ 2013-2017 (Annualized)	8.32%
▶ 1985-2017 (Annualized)	8.93%

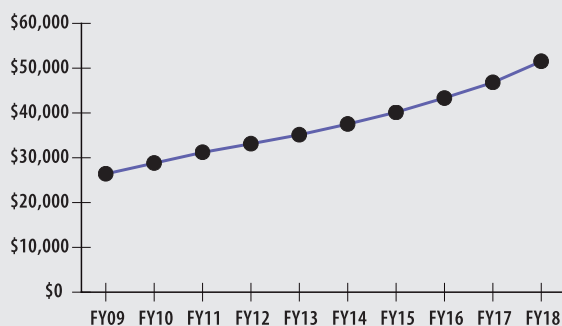
#### FUNDED RATIO (1987-2017)



#### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



#### 10-YEAR HISTORY OF APPROPRIATIONS (IN THOUSANDS)



#### INVESTMENT RETURN HISTORY

<b>33 years 2017</b> 8.36%	<b>32 years 2016</b> 8.08%	<b>31 years 2015</b> 8.09%
<b>10 years 2017</b> 5.35%	<b>10 years 2016</b> 4.53%	<b>10 years 2015</b> 5.03%
<b>5 years 2017</b> 9.80%	<b>5 years 2016</b> 9.03%	<b>5 years 2015</b> 7.37%

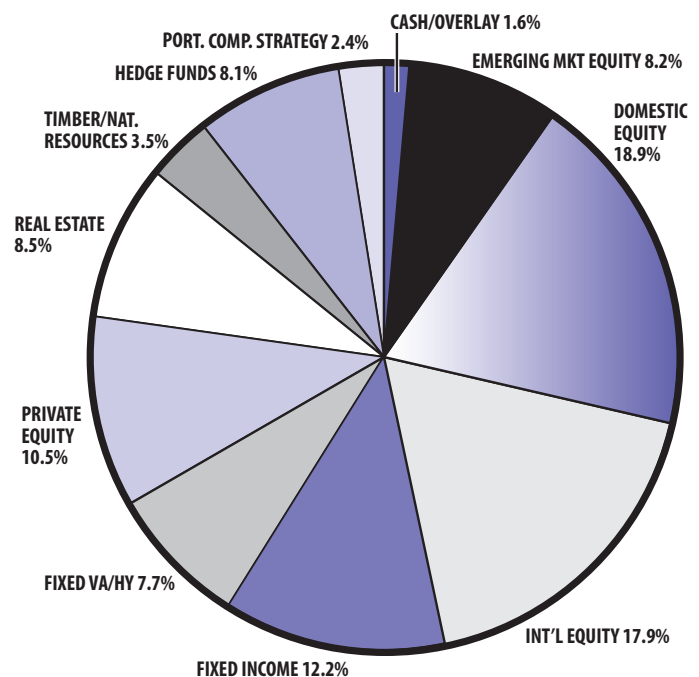
#### ACTUARIAL

▶ Funded Ratio	43.4%
▶ Date of Last Valuation	01/16
▶ Actuary	KMS
▶ Assumed Rate of Return	7.75%
▶ Funding Schedule	9.95% Total Increasing
▶ Year Fully Funded	2035
▶ Unfunded Liability	\$774.6 M
▶ Total Pension Appropriation (Fiscal 2018)	\$51.5 M

	ACTIVE	RETIRED
▶ Number of Members	6,773	3,382
▶ Total Payroll/Benefit	\$282.9 M	\$66.6 M
▶ Average Salary/Benefit	\$41,800	\$19,700
▶ Average Age	48	73
▶ Average Service	10.6 years	NA

#### ASSET ALLOCATION (12/31/17)



#### EARNED INCOME OF DISABILITY RETIREES (2016)

▶ Number of Disability Retirees	264
▶ Number Who Reported Earnings	82
▶ Number of Excess Earners	0
▶ Total Amount of Refund Due	\$0

▶ 2017 Return	17.58%
▶ 2017 Market Value	\$712.0M
▶ 2013-2017 (Annualized)	9.80%
▶ 1985-2017 (Annualized)	8.36%

## PRIM

84 State Street  
Suite 250  
Boston, MA 02109  
Phone 617-946-8401  
Fax 617-946-8475

### Board Members

Treasurer Deborah B. Goldberg (Chairperson),  
Robert Brousseau, Ruth Ellen Fitch,  
James B.G. Hearty, Theresa McGoldrick, Esq.,  
Peter Monaco, Dennis Naughton,

Carly Rose, Paul E. Shanley, Esq.

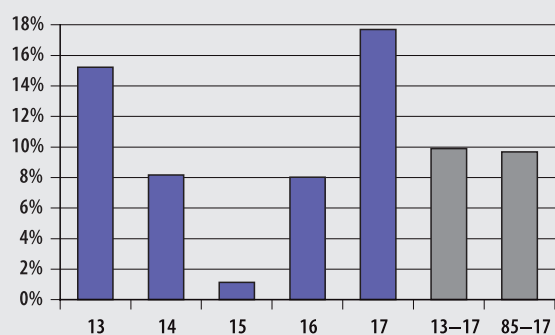
### Board Administrator

Michael G. Trotsky, CFA

### Board Meeting

Every other month, day and date varies

### INVESTMENT RETURN (2013-2017, 5 YEAR AND 33 YEAR AVERAGES)



### INVESTMENT RETURN HISTORY

#### 33 years 2017

9.69%

#### 32 years 2016

9.45%

#### 31 years 2015

9.49%

#### 10 years 2017

5.57%

#### 10 years 2016

5.04%

#### 10 years 2015

5.86%

#### 5 years 2017

9.89%

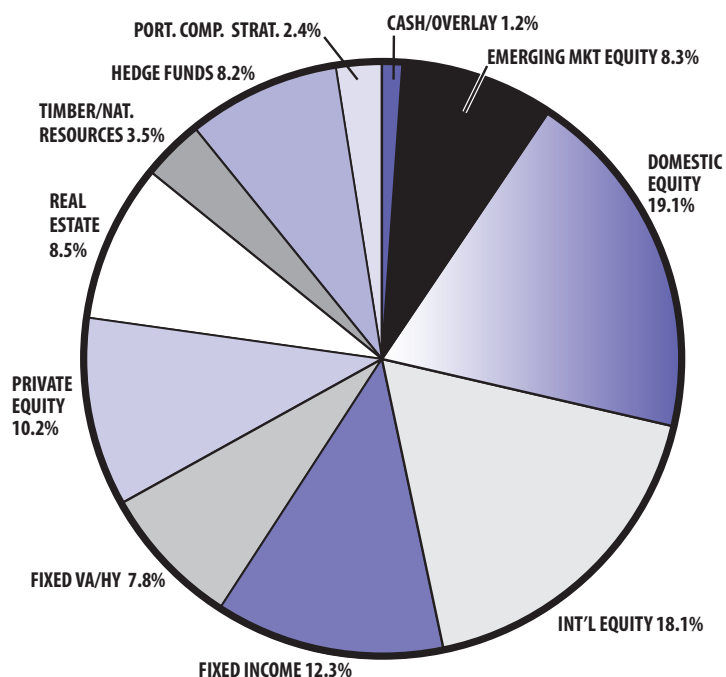
#### 5 years 2016

9.17%

#### 5 years 2015

7.53%

### ASSET ALLOCATION (12/31/17)



▶ 2017 Return	17.69%
▶ 2017 Market Value	\$71.9 B
▶ 2013-2017 (Annualized)	9.89%
▶ 1985-2017 (Annualized)	9.69%



# DISABILITY

## RETIREMENT STATISTICS

(as of 12/31/17)

	DISABILITY PANEL REQUESTS	DISABILITY RETIREMENT APPROVALS	ACCIDENTAL DEATH APPROVALS	DISABILITY NURSE CME REVIEWS	PHYSICIAN CME/RTS REVIEWS
<b>RETIREMENT BOARDS WITH 40–399 ACTIVE MEMBERS</b>					
Adams Retirement Board	0	0	0	2	0
Amesbury Retirement Board	0	0	0	0	0
Blue Hills Regional School Retirement Board	0	0	0	0	0
Clinton Retirement Board	0	1	0	1	0
Easthampton Retirement Board	1	1	0	1	0
Fairhaven Retirement Board	2	0	0	2	0
Gardner Retirement Board	1	0	1	3	0
Gr. Lawrence Sanitary District Retirement Board	0	0	0	0	0
Hull Retirement Board	0	0	0	1	0
Mass Housing Finance Agency Retirement Board	1	1	0	0	0
Maynard Retirement Board	0	0	0	0	0
Milton Retirement Board	1	0	0	1	0
Minuteman Regional School District Ret. Board	0	0	0	0	0
Montague Retirement Board	0	0	0	1	0
Newburyport Retirement Board	1	0	0	1	0
North Adams Retirement Board	3	2	0	0	0
Northbridge Retirement Board	0	0	0	3	0
Reading Retirement Board	1	0	0	5	0
Saugus Retirement Board	1	2	1	3	1
Southbridge Retirement Board	2	2	0	2	0
Stoneham Retirement Board	1	0	0	0	0
Webster Retirement Board	1	0	0	0	0
Winthrop Retirement Board	0	0	0	0	0
<b>RETIREMENT BOARDS WITH 400–599 ACTIVE MEMBERS</b>					
Belmont Retirement Board	3	3	0	4	0
Concord Retirement Board	0	1	0	2	0
Danvers Retirement Board	0	0	0	3	0
Dedham Retirement Board	4	2	0	1	0
Gloucester Retirement Board	1	0	0	3	0
Greenfield Retirement Board	0	0	0	3	0
Marblehead Retirement Board	0	1	0	3	1
Melrose Retirement Board	0	0	1	3	0
Milford Retirement Board	3	2	1	1	0
Natick Retirement Board	2	0	0	0	0
North Attleboro Retirement Board	1	1	0	3	0
Norwood Retirement Board	2	0	0	3	2
Revere Retirement Board	4	4	0	6	0
Shrewsbury Retirement Board	0	1	0	4	0
Swampscott Retirement Board	1	2	0	1	0
Wakefield Retirement Board	2	0	0	2	0
Winchester Retirement Board	1	0	0	2	0

# DISABILITY

## RETIREMENT STATISTICS

(as of 12/31/17)

DISABILITY RETIREMENT APPROVALS  
ACCIDENTAL DEATH APPROVALS  
DISABILITY NURSE CME REVIEWS  
PHYSICIAN CME/RTS REVIEWS  
DISABILITY PANEL REQUESTS

RETIREMENT BOARDS WITH 600-899 ACTIVE MEMBERS					
Andover Retirement Board	2	3	0	2	0
Arlington Retirement Board	7	6	2	3	0
Attleboro Retirement Board	2	3	2	6	1
Beverly Retirement Board	1	1	0	3	1
Braintree Retirement Board	0	1	0	3	0
Chelsea Retirement Board	6	4	0	4	0
Dukes County Contributory Retirement System	0	1	0	3	0
Everett Retirement Board	2	1	0	5	0
Falmouth Retirement Board	1	3	0	6	1
Fitchburg Retirement Board	1	1	1	8	0
Hingham Retirement Board	1	1	0	1	0
Leominster Retirement Board	5	2	0	5	0
Lexington Retirement Board	4	3	0	4	0
Malden Retirement Board	8	3	2	11	0
Marlborough Retirement Board	0	0	1	3	0
Medford Retirement Board	5	5	0	8	0
Methuen Retirement Board	4	3	0	4	0
Needham Retirement Board	0	1	0	0	0
Northampton Retirement Board	0	1	1	3	0
Peabody Retirement Board	2	0	0	4	1
Watertown Retirement Board	1	3	2	5	0
Wellesley Retirement Board	2	0	0	3	0
West Springfield Retirement Board	0	0	0	3	0
Weymouth Retirement Board	7	2	0	11	0
Woburn Retirement Board	2	1	0	7	0
RETIREMENT BOARDS WITH 900-2,399 ACTIVE MEMBERS					
Berkshire County Retirement Board	1	0	0	4	0
Brockton Retirement Board	7	12	1	14	0
Brookline Retirement Board	8	8	2	14	0
Chicopee Retirement Board	4	6	2	17	0
Fall River Retirement Board	7	7	1	19	0
Framingham Retirement Board	5	1	0	6	0
Franklin County Retirement Board	0	0	0	3	0
Haverhill Retirement Board	4	3	1	4	0
Holyoke Retirement Board	3	2	1	11	0
Lawrence Retirement Board	6	6	1	11	0
Lowell Retirement Board	7	8	3	20	1
Lynn Retirement Board	6	4	0	13	0

# DISABILITY

## RETIREMENT STATISTICS

(as of 12/31/17)

	DISABILITY PANEL REQUESTS	DISABILITY RETIREMENT APPROVALS	ACCIDENTAL DEATH APPROVALS	DISABILITY NURSE CME REVIEWS	PHYSICIAN CME/RTS REVIEWS
<b>RETIREMENT BOARDS WITH 900-2,399 ACTIVE MEMBERS (CONT'D)</b>					
Mass Port Authority Retirement Board	2	1	0	5	0
Mass Water Resource Authority Retirement Board	4	5	0	6	1
New Bedford Retirement Board	9	11	1	19	0
Newton Retirement Board	5	2	0	3	0
Pittsfield Retirement Board	3	2	0	3	0
Plymouth Retirement Board	1	3	0	11	0
Quincy Retirement Board	8	2	0	12	0
Salem Retirement Board	4	0	1	6	0
Somerville Retirement Board	4	3	0	4	0
Taunton Retirement Board	5	1	1	8	0
Waltham Retirement Board	4	5	2	7	0
Westfield Retirement Board	2	1	0	7	0
<b>RETIREMENT BOARDS WITH 2,400-10,000 ACTIVE MEMBERS</b>					
Barnstable County Board of Retirement	8	13	2	44	0
Bristol County Board of Retirement	7	7	2	30	0
Cambridge Retirement Board	12	16	0	18	1
Essex Regional Retirement Board	6	5	0	9	2
Hampden County Regional Retirement Board	6	5	2	13	0
Hampshire County Regional Retirement Board	6	2	1	8	0
Middlesex County Retirement Board	15	12	0	39	1
Norfolk County Retirement Board	8	8	0	28	0
Plymouth County Retirement Board	16	9	0	27	0
Springfield Retirement Board	16	12	0	65	0
Worcester Regional Retirement Board	9	11	1	41	1
Worcester Retirement Board	19	9	1	22	0
<b>RETIREMENT BOARDS WITH 20,500-90,000 ACTIVE MEMBERS</b>					
Boston Retirement Board	43	33	6	100	2
State Retirement Board	126	122	6	424	5
Teachers Retirement Board	14	24	0	35	0
<b>TOTAL ALL RETIREMENT BOARDS:</b>	<b>523</b>	<b>456</b>	<b>53</b>	<b>1315</b>	<b>22</b>

### RESTORATION TO SERVICE STATISTICS *(Provided for those boards where a disability retiree has returned to work.)*

Attleboro Retirement System <b>1</b>		

# INVESTMENT VENDORS

- The following is a listing of the investment managers, custodians, and consultants that serve the Massachusetts public pension systems. The listing is based on information supplied by the retirement boards.

RETIREMENT BOARD	INVESTMENT VENDORS		
<b>ADAMS</b> ► <b>Custodian:</b> State Street Bank & Trust ► <b>Consultant:</b> Fiduciary Investment Advisors	<ul style="list-style-type: none"> <li>Capital Research and Management</li> </ul>	<ul style="list-style-type: none"> <li>Granite Investment Advisors</li> <li>RhumbLine Advisers</li> </ul>	
<b>AMESBURY</b>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>ANDOVER</b> ► <b>Consultant:</b> Dahab Associates	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>ARLINGTON</b> ► <b>Custodian:</b> State Street Bank & Trust	<ul style="list-style-type: none"> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>Wilshire Associates Inc.</li> </ul>	
<b>ATTLEBORO</b> ► <b>Custodian:</b> People's United Bank ► <b>Consultant:</b> Dahab Associates Inc.	<ul style="list-style-type: none"> <li>Boston Advisors, LLC</li> <li>BTG Pactual Timberland Investment Group</li> <li>Copeland Capital Management</li> <li>Fidelity Institutional Asset Management</li> <li>Frontier Capital Management Co., LLC</li> </ul>	<ul style="list-style-type: none"> <li>Hancock Timber Resource Group, Inc.</li> <li>Herndon Capital Management, LLC</li> <li>Intercontinental Real Estate Corp.</li> <li>Invesco Core Real Estate USA, LP</li> </ul>	<ul style="list-style-type: none"> <li>Invesco National Trust Company</li> <li>PRIT</li> <li>RhumbLine Advisers</li> <li>State Street Global Advisors</li> </ul>
<b>BARNSTABLE COUNTY</b>	<ul style="list-style-type: none"> <li>Intercontinental Capital Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>UBS Realty Investors, LLC</li> </ul>
<b>BELMONT</b> ► <b>Custodian:</b> People's United Bank ► <b>Consultant:</b> New England Pension Consultants	<ul style="list-style-type: none"> <li>AEW Capital Management, LP</li> <li>Atlanta Capital</li> <li>Harbourvest Partners, LLC</li> </ul>	<ul style="list-style-type: none"> <li>Loomis Sayles &amp; Company</li> <li>Pacific Investment Management Company, LLC</li> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>RhumbLine Advisers</li> <li>Rothschild Asset Management Inc.</li> <li>Scout Capital Management, LLC</li> </ul>
<b>BERKSHIRE COUNTY</b>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>BEVERLY</b>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>BLUE HILLS REGIONAL</b>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>BOSTON (CITY)</b> ► <b>Custodian:</b> State Street Bank & Trust ► <b>Consultant:</b> New England Pension Consultants	<ul style="list-style-type: none"> <li>57 Stars, LLC</li> <li>AEW Capital Management, LP</li> <li>Alcentra NY, LLC</li> <li>Angelo, Gordon &amp; Co., LP</li> <li>Ardlight Capital Partners, LLC</li> <li>Aristotle Capital Management, LLC</li> <li>Arsenal Real Estate Funds, LLC</li> <li>Ascent Venture Partners</li> <li>Audax Group</li> <li>Aurora Management Partners</li> <li>AXA Real Estate Investment Managers Ltd.</li> <li>Bernzott Capital Advisors</li> <li>BlackRock Advisors, LLC</li> <li>Blue Point Capital Partners, LLC</li> <li>Boston Millennia Partners</li> <li>Brookfield Asset Management</li> <li>CCMP Capital Advisors, LLC</li> <li>Centersquare Investment Management Holdings, Inc.</li> <li>Columbia Management Investment Advisors, LLC</li> <li>Commonwealth Capital Ventures</li> <li>Courtland Partners</li> <li>Crescent Capital Group, LP</li> <li>DDJ Capital Management</li> <li>D.E. Shaw Investment Management, LLC</li> <li>DRC Capital, LLP</li> <li>Dune Capital Management, LP</li> <li>Energy Spectrum Partners</li> <li>EnTrust Partners, LLC</li> </ul>	<ul style="list-style-type: none"> <li>Evercore Advisors, LLC</li> <li>Federal Street Partners, LLC</li> <li>Fisher Investments</li> <li>Goldentree Asset Management, LP</li> <li>Grosvenor Capital Management, LP</li> <li>Hamilton Lane</li> <li>Hearthstone Inc.</li> <li>Income Research + Management</li> <li>Insight Venture Management</li> <li>Intech</li> <li>Intercontinental Real Estate Corp.</li> <li>Invesco Core Real Estate USA, LP</li> <li>J.F. Lehman &amp; Company, Inc.</li> <li>J.P. Morgan Investment Management, Inc.</li> <li>J.W. Childs Associates, LP</li> <li>LaSalle Investment Management, Inc.</li> <li>Lazard Asset Management, LLC</li> <li>Lexington Partners, LP</li> <li>Loomis Sayles &amp; Company</li> <li>Mesirow Advanced Strategies, Inc.</li> <li>Mesirow Financial Investment Management, Inc.</li> <li>MPM Capital, LP</li> <li>NGP Energy Capital Management, LLC</li> <li>Oaktree Capital Management, LP</li> <li>PanAgora Asset Management, Inc.</li> <li>Pearlmark Investment Advisors, LLC</li> <li>Perella Weinberg Partners Capital Management, LP</li> </ul>	<ul style="list-style-type: none"> <li>Permal Asset Management, Inc.</li> <li>Polunin Capital Partners</li> <li>Prudential Capital Partners</li> <li>RhumbLine Advisers</li> <li>Sanderling Ventures</li> <li>SCP Private Equity Partners</li> <li>Segall Bryant &amp; Hamill</li> <li>Siguler Guff Advisers, LLC</li> <li>SL Capital Partners</li> <li>State Street Global Advisors</li> <li>Sterling Venture Partners, LLC</li> <li>TA Realty</li> <li>TH Lee Putnam Ventures</li> <li>Thomas H. Lee Partners, LP</li> <li>Thoma Bravo, LLC</li> <li>Thomas Weisel Global Growth Partners, LLC</li> <li>Todd Asset Management</li> <li>Tristan Capital Partners</li> <li>Vanguard Venture Partners, LLC</li> <li>Vontobel Asset Management, Inc.</li> <li>W Capital Partners</li> <li>Wells Capital Management, Inc.</li> <li>Western Technology</li> <li>Westfield Capital Management Company, LP</li> <li>Westport Capital Partners, LLC</li> <li>Z Capital Partners, LLC</li> <li>Zevenbergen Capital Investments, LLC</li> </ul>

RETIREMENT BOARD	INVESTMENT VENDORS		
<b>BOSTON TEACHERS</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>BRAINTREE</b> ▶ <b>Custodian:</b> SEI Private Trust Company	<ul style="list-style-type: none"> <li>• Lexington Partners, LP</li> </ul>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• SEI Investments Management Corporation</li> </ul>
<b>BRISTOL COUNTY</b> ▶ <b>Custodian:</b> State Street Bank & Trust ▶ <b>Consultant:</b> Segal Marco Advisors	<ul style="list-style-type: none"> <li>• Aberdeen Asset Management</li> <li>• Arrowstreet Capital, LP</li> <li>• Ashmore Investment Advisors, Ltd.</li> <li>• BlackRock Investment Management, LLC</li> <li>• Brookfield Timberlands Management, LP</li> <li>• CB Richard Ellis Group, Inc.</li> <li>• Clearbridge Investments</li> <li>• Colchester Global Investors</li> <li>• Columbia Management Investment Advisers, LLC</li> <li>• DN Partners</li> <li>• Dupont Capital Management</li> <li>• Earnest Partners, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• GCM Customized Fund Investment Group</li> <li>• Hunt Investment Management, LLC</li> <li>• IFM Investors (US) Advisor</li> <li>• Income Research &amp; Management</li> <li>• Intech</li> <li>• Intercontinental Real Estate Corp.</li> <li>• Invesco Advisers, Inc.</li> <li>• Lazard Asset Management, LLC</li> <li>• LSV Asset Management</li> <li>• Lyrical Asset Management, LP</li> <li>• Massachusetts Financial Services Company</li> <li>• Mesirow Financial Private Equity Advisors, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>• New Boston Fund, Inc.</li> <li>• Pacific Investment Management Company, LLC</li> <li>• Polaris Capital Management, LLC</li> <li>• PRIT</li> <li>• RBC Global Asset Management (U.S.), Inc.</li> <li>• Rice Hall James &amp; Associates, LLC</li> <li>• RREEF Management, LLC</li> <li>• SEI Trust Company</li> <li>• Stone Harbor Investment Partners</li> <li>• TA Realty</li> <li>• Timberland Investment Resources, LLC</li> <li>• WL Ross &amp; Co., LLC</li> </ul>
<b>BROCKTON</b> ▶ <b>Custodian:</b> SEI Private Trust Company ▶ <b>Consultant:</b> Fiduciary Investment Advisors	<ul style="list-style-type: none"> <li>• Aberdeen Asset Management</li> <li>• Arsenal Real Estate Partners</li> <li>• Ascent Venture Partners</li> <li>• Charlesbank Capital Partners, LLC</li> <li>• HealthPoint, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Hunt Investment Management, LLC</li> <li>• Intercontinental Capital Management, LLC</li> <li>• Invesco Private Capital, Inc.</li> <li>• Landmark Partners, LLC</li> <li>• Mesirow Financial Investment Management, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>• New Boston Fund, Inc.</li> <li>• Oppenheimer Alternative Investment Management</li> <li>• SEI Investments Management Corp.</li> <li>• Siguler Guff Advisers, LLC</li> </ul>
<b>BROOKLINE</b> ▶ <b>Custodian:</b> Russell Investments	<ul style="list-style-type: none"> <li>• AEW Capital Management, LP</li> <li>• Hancock Timber Resource Group, Inc.</li> <li>• HarbourVest Partners, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Invesco Private Capital, Inc.</li> <li>• Lexington Partners, LP</li> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• Russell Investment Group</li> <li>• Sustainable Woodlands Partners, LLC</li> </ul>
<b>CAMBRIDGE</b> ▶ <b>Custodian:</b> People's United Bank ▶ <b>Consultant:</b> Segal Marco Advisors	<ul style="list-style-type: none"> <li>• Aberdeen Asset Management</li> <li>• AEW Capital Management, LP</li> <li>• Ascent Venture Partners</li> <li>• BlackRock Investment Management, LLC</li> <li>• Brandywine Global Investment Management, LLC</li> <li>• Columbia Management Investment Advisers, LLC</li> <li>• Fidelity Institutional Asset Management</li> <li>• Hamilton Lane</li> <li>• Hancock Timber Resource Group, Inc.</li> <li>• IFM Investors (US) Advisor</li> </ul>	<ul style="list-style-type: none"> <li>• Income Research &amp; Management</li> <li>• Intercontinental Real Estate Corp.</li> <li>• J.P. Morgan Investment Management</li> <li>• Landmark Partners, LLC</li> <li>• Lazard Asset Management, LLC</li> <li>• Lexington Partners, LP</li> <li>• Loomis Sayles &amp; Co.</li> <li>• MacKay Shields, LLC</li> <li>• MFS Institutional Advisers, Inc.</li> <li>• Penn Square Global Real Estate Group, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Polaris Capital Management, LLC</li> <li>• PRIT</li> <li>• RBC Global Asset Management (U.S.), Inc.</li> <li>• RhumbLine Advisers</li> <li>• Rockwood Capital, LLC</li> <li>• State Street Global Advisors</li> <li>• UBS Realty Advisers, LLC</li> <li>• WEDGE Capital Management, LLP</li> <li>• Wellington Management Company</li> </ul>
<b>CHELSEA</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>CHICOPEE</b> ▶ <b>Custodian:</b> SEI Private Trust Company	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• SEI Investments Management Corp.</li> </ul>	
<b>CLINTON</b> ▶ <b>Consultant:</b> Trust Advisory Group, Ltd.	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>CONCORD</b> ▶ <b>Custodian:</b> Comerica Securities ▶ <b>Consultant:</b> Fiduciary Investment Advisors	<ul style="list-style-type: none"> <li>• Columbia Threadneedle Investments</li> </ul>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• Russell Investment Group</li> </ul>
<b>DANVERS</b> ▶ <b>Custodian:</b> People's United Bank ▶ <b>Consultant:</b> Graystone Consulting	<ul style="list-style-type: none"> <li>• Barings, LLC</li> <li>• Equus Capital Partners, Ltd.</li> <li>• Gerber-Taylor Management Company</li> </ul>	<ul style="list-style-type: none"> <li>• Hillswick Asset Management</li> <li>• Lyrical Asset Management</li> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• RhumbLine Advisers</li> <li>• TA Realty</li> <li>• TWIN Capital Management</li> </ul>

RETIREMENT BOARD	INVESTMENT VENDORS		
DEDHAM	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>DUKES COUNTY</b> ▶ <b>Custodian:</b> People's United Bank ▶ <b>Consultant:</b> Dahab Associates, Inc.	<ul style="list-style-type: none"> <li>Atlanta Capital</li> <li>Garcia Hamilton &amp; Associates LP</li> </ul>	<ul style="list-style-type: none"> <li>Polen Capital Management, LLC</li> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>Vanguard</li> </ul>
EASTHAMPTON	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>ESSEX COUNTY</b> ▶ <b>Custodian:</b> State Street Bank & Trust	<ul style="list-style-type: none"> <li>Ascent Venture Partners</li> <li>BlackRock Investment Management, LLC</li> <li>Boston Millennia Partners</li> <li>Intercontinental Real Estate Corp.</li> </ul>	<ul style="list-style-type: none"> <li>Levine Leichtman Capital Partners, Inc..</li> <li>MassVentures</li> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>Principal Real Estate Investors, LLC</li> <li>Sentinel Real Estate Corporation</li> <li>TA Realty</li> </ul>
EVERETT	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
FAIRHAVEN	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
FALL RIVER	<ul style="list-style-type: none"> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>SL Capital Partners, LLP</li> </ul>	
<b>FALMOUTH</b> ▶ <b>Custodian:</b> State Street Bank & Trust ▶ <b>Consultant:</b> Wainwright Investment Counsel, LLC	<ul style="list-style-type: none"> <li>Baring Asset Management (Asia) Limited</li> <li>Dimensional Fund Advisors, LP</li> <li>Earnest Partners, LLC</li> <li>Hamilton Lane</li> <li>HGK Asset Management, Inc.</li> <li>Intercontinental Real Estate Corp.</li> </ul>	<ul style="list-style-type: none"> <li>Invesco Private Capital, Inc.</li> <li>Lexington Partners, LP</li> <li>LMCG Investments, LLC</li> <li>Mesirow Financial Private Equity Advisors, Inc.</li> <li>Metropolitan Real Estate Equity Management, LLC</li> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>Principal Real Estate Investors, LLC</li> <li>RhumbLine Advisers</li> <li>SEI Trust Company</li> <li>Seizert Capital Partners, LLC</li> <li>Siguler Guff Advisers, LLC</li> <li>State Street Global Advisors</li> </ul>
FITCHBURG	<ul style="list-style-type: none"> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>TA Realty</li> </ul>	
FRAMINGHAM	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>FRANKLIN COUNTY</b> ▶ <b>Custodian:</b> Comerica Bank ▶ <b>Consultant:</b> Dahab Associates, Inc.	<ul style="list-style-type: none"> <li>Aberdeen Asset Management</li> <li>Income Research &amp; Management</li> <li>O'Shaughnessy Asset Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>Polen Capital Management, LLC</li> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>Seizert Capital Partners, LLC</li> <li>Systematic Financial Management, LP</li> </ul>
GARDNER	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
GLOUCESTER	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>GREATER LAWRENCE</b> ▶ <b>Custodian:</b> BNY Mellon Asset Servicing	<ul style="list-style-type: none"> <li>Seaward Management</li> </ul>		
GREENFIELD	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>HAMPDEN COUNTY REGIONAL</b> ▶ <b>Consultant:</b> Segal Marco Advisors	<ul style="list-style-type: none"> <li>GCM Customized Fund Investment Group</li> <li>Invesco Private Capital, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>Long Wharf Real Estate Partners, LLC</li> <li>New Boston Fund, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>
<b>HAMPSHIRE COUNTY</b> ▶ <b>Consultant:</b> New England Pension Consultants	<ul style="list-style-type: none"> <li>Ascent Venture Partners</li> <li>Barings LLC</li> <li>Colchester Global Investors</li> <li>Glouston Capital Partners, LLC</li> <li>Intercontinental Real Estate Corp.</li> </ul>	<ul style="list-style-type: none"> <li>Lexington Partners, LP</li> <li>Massachusetts Financial Services Company</li> <li>Perella Weinberg Partners Capital Management, LP</li> <li>Polaris Capital Management, LLC</li> <li>Portfolio Advisors, LLC</li> </ul>	<ul style="list-style-type: none"> <li>PRIT</li> <li>RBC Global Asset Management (U.S.) Inc.</li> <li>RhumbLine Advisers</li> <li>Shenkman Capital Management, Inc.</li> </ul>

RETIREMENT BOARD	INVESTMENT VENDORS		
<b>HAVERHILL</b> ▶ <b>Custodian:</b> People's United Bank ▶ <b>Consultant:</b> Wainwright Investment Counsel, LLC	<ul style="list-style-type: none"> <li>• DDJ Capital Management, LLC</li> <li>• Fisher Investments</li> <li>• Global Forest Partners, LP</li> <li>• Globespan Capital Management, Inc.</li> <li>• GrandBanks Capital</li> <li>• Income Research + Management</li> </ul>	<ul style="list-style-type: none"> <li>• Intercontinental Real Estate Corporation</li> <li>• Massachusetts Financial Services Company</li> <li>• Mesirow Financial Institutional Real Estate</li> <li>• Molpus Woodlands Group, LLC</li> <li>• PRIT</li> <li>• Putnam Advisory Company, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• RhumbLine Advisers</li> <li>• Stafford Private Equity, Inc.</li> <li>• Systematic Financial Management, LP</li> <li>• TerraCap Management</li> <li>• The DSF Group</li> <li>• Victory Capital Management</li> </ul>
<b>HINGHAM</b> ▶ <b>Consultant:</b> Meketa Investment Group	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>HOLYOKE</b> ▶ <b>Consultant:</b> Segal Marco Advisors	<ul style="list-style-type: none"> <li>• Aberdeen Asset Management</li> <li>• Acadian Asset Management, LLC</li> <li>• Algert Global</li> <li>• American Realty Advisors</li> <li>• Boston Company Asset Management, LLC</li> <li>• Brandywine Global Investment Management, LLC</li> <li>• Charles Schwab &amp; Co., Inc.</li> <li>• Constitution Capital Partners, LLC</li> <li>• Denver Investments</li> </ul>	<ul style="list-style-type: none"> <li>• Fidelity Institutional Asset Management</li> <li>• Flynn Financial Partners</li> <li>• Industry Capital Advisors, LLC</li> <li>• LMCG Investments</li> <li>• Long Wharf Real Estate Partners, LLC</li> <li>• Mesirow Financial Private Equity Advisors, Inc.</li> <li>• Monroe Capital</li> <li>• Oberweis Asset Management, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>• Polaris Capital Management, LLC</li> <li>• PRIT</li> <li>• Putnam Investment Management, LLC</li> <li>• RBC Global Asset Management (U.S.) Inc.</li> <li>• Seizert Capital Partners, LLC</li> <li>• State Street Global Advisors</li> <li>• TerraCap Management</li> <li>• Wasatch Advisors, Inc.</li> </ul>
<b>HULL</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>LAWRENCE</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>LEOMINSTER</b> ▶ <b>Custodian:</b> State Street Bank & Trust	<ul style="list-style-type: none"> <li>• Massachusetts Financial Services Company</li> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• Templeton Investment Counsel</li> </ul>	<ul style="list-style-type: none"> <li>• Union Labor Life Insurance Company</li> </ul>
<b>LEXINGTON</b> ▶ <b>Custodian:</b> State Street Bank & Trust ▶ <b>Consultant:</b> Meketa Investment Group, Inc.	<ul style="list-style-type: none"> <li>• Acadian Asset Management, LLC</li> <li>• Beacon Capital Partners, LLC</li> <li>• Fidelity Investments</li> <li>• Fiduciary Management, Inc.</li> <li>• Golub Capital Partners</li> </ul>	<ul style="list-style-type: none"> <li>• Kayne Anderson Rudnick Investment Management</li> <li>• Loomis Sayles &amp; Company</li> <li>• Matthews International Capital Management, LLC</li> <li>• Monroe Capital</li> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• RhumbLine Advisers</li> <li>• Wellington Management Company, LLP</li> <li>• White Oak Global Advisors, LLC</li> <li>• William Blair &amp; Company, LLC</li> </ul>
<b>LOWELL</b> ▶ <b>Custodian:</b> People's United Bank	<ul style="list-style-type: none"> <li>• Ascent Venture Partners</li> <li>• Boston Millennia Partners</li> <li>• Charles River Ventures</li> </ul>	<ul style="list-style-type: none"> <li>• Charles River Ventures</li> <li>• Intercontinental Real Estate Corporation</li> </ul>	<ul style="list-style-type: none"> <li>• PRIT</li> <li>• Sentinel Real Estate Corporation</li> </ul>
<b>LYNN</b>	<ul style="list-style-type: none"> <li>• Ascent Venture Partners</li> <li>• BlackRock Investment Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• BlackRock Realty Advisors, Inc.</li> <li>• Fidelity Investments Money Management, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>• Hunt Investment Management, LLC</li> <li>• PRIT</li> </ul>
<b>MHFA</b> ▶ <b>Custodian:</b> State Street Bank & Trust ▶ <b>Consultant:</b> Meketa Investment Group, Inc.	<ul style="list-style-type: none"> <li>• Aberdeen Asset Management</li> <li>• AEW Capital Management, LP</li> <li>• Ascent Venture Partners</li> <li>• Columbia Management Investment Advisers, LLC</li> <li>• Constitution Capital Partners, LLC</li> <li>• Dimensional Fund Advisors, LP</li> </ul>	<ul style="list-style-type: none"> <li>• Goldman Sachs Asset Management, LP</li> <li>• HarbourVest Partners, LLC</li> <li>• IFM Investors Advisor</li> <li>• Intercontinental Real Estate Corporation</li> <li>• KBI Global Investors (North America) Ltd.</li> </ul>	<ul style="list-style-type: none"> <li>• LMCG Investments, LLC</li> <li>• Logan Circle Partners, LP</li> <li>• Longfellow Investment Management</li> <li>• State Street Global Advisors</li> <li>• TA Realty</li> </ul>
<b>MWRA</b> ▶ <b>Custodian:</b> People's United Bank ▶ <b>Consultant:</b> New England Pension Consultants	<ul style="list-style-type: none"> <li>• Alcentra NY, LLC</li> <li>• Ascent Venture Partners</li> <li>• CarVal Investors</li> <li>• Castile Ventures</li> <li>• Cerberus Capital Management, LP</li> <li>• Coho Partners, Ltd.</li> <li>• Courtland Partners</li> <li>• Entrust Partners, LLC</li> <li>• Foundry Group, LLP</li> <li>• Invesco Trust Company</li> <li>• Invesco Private Capital, Inc.</li> <li>• J.F. Lehman &amp; Company</li> </ul>	<ul style="list-style-type: none"> <li>• Kayne Anderson Capital Advisors, LP</li> <li>• Landmark Partners, LLC</li> <li>• Lee Munder Capital Group, LLC</li> <li>• Loomis Sayles &amp; Company</li> <li>• Mesirow Financial Institutional Real Estate</li> <li>• Morgan Stanley</li> <li>• Pacific Investment Management Company, LLC</li> <li>• Park Square Capital</li> <li>• Pinebridge Investments, LLC</li> <li>• Polen Capital Management, LLC</li> <li>• PRIT</li> <li>• Private Advisors, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• RhumbLine Advisers</li> <li>• Robeco Institutional Asset Management U.S., Inc.</li> <li>• Schroders Investment Management North America, Inc.</li> <li>• SEI Trust Corporation</li> <li>• Select Equity Group, LP</li> <li>• TA Realty</li> <li>• TerraCap Management</li> <li>• Wellington Management Company, LLP</li> <li>• William Blair &amp; Company, LLC</li> <li>• WL Ross &amp; Co., LLC</li> </ul>

RETIREMENT BOARD	INVESTMENT VENDORS		
<b>MALDEN</b> ► <b>Custodian:</b> State Street Bank & Trust	<ul style="list-style-type: none"> <li>De Burlo Group, Inc.</li> </ul>		
<b>MARBLEHEAD</b>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>MARLBOROUGH</b> ► <b>Custodian:</b> Comerica Bank ► <b>Consultant:</b> Meketa Investment Group, Inc.	<ul style="list-style-type: none"> <li>Clarion Partners</li> <li>Colony Realty Partners</li> <li>Constitution Capital Partners, LLC</li> <li>Dimensional Fund Advisors LP</li> </ul>	<ul style="list-style-type: none"> <li>Driehaus Capital Management, LLC</li> <li>Fiduciary Management, Inc.</li> <li>Frontier Capital Management Co., LLC</li> <li>Payden &amp; Rygel</li> </ul>	<ul style="list-style-type: none"> <li>RhumbLine Advisers</li> <li>Shenkman Capital Management, Inc.</li> <li>SL Capital Partners, LLP</li> <li>State Street Global Advisors</li> </ul>
<b>MASSPORT</b> ► <b>Custodian:</b> People's United Bank ► <b>Consultant:</b> Wilshire Associates	<ul style="list-style-type: none"> <li>Aberdeen Asset Management, Inc.</li> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>Pzena Investment Management, LLC</li> <li>State Street Global Advisors</li> </ul>	<ul style="list-style-type: none"> <li>Wellington Management Company, LLP</li> </ul>
<b>MAYNARD</b> ► <b>Custodian:</b> State Street Bank & Trust	<ul style="list-style-type: none"> <li>Boston Advisors, LLC</li> </ul>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>Sequin Partners, LLC</li> </ul>
<b>MEDFORD</b> ► <b>Custodian:</b> People's United Bank ► <b>Consultant:</b> New England Pension Consultants	<ul style="list-style-type: none"> <li>City of London Investment Management</li> <li>Columbia Management Investment Advisors, LLC</li> <li>Lazard Asset Management, LLC</li> <li>Loomis Sayles &amp; Company</li> </ul>	<ul style="list-style-type: none"> <li>Mellon Capital Management Corporation</li> <li>PRIT</li> <li>RhumbLine Advisers</li> </ul>	<ul style="list-style-type: none"> <li>Standard Life Investment</li> <li>Western Asset Management Company</li> <li>William Blair &amp; Company, LLC</li> </ul>
<b>MELROSE</b>	<ul style="list-style-type: none"> <li>Ascent Venture Partners</li> <li>Hunt Investment Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>Intercontinental Real Estate Corporation</li> <li>Invesco Private Capital, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>
<b>METHUEN</b>	<ul style="list-style-type: none"> <li>BlackRock Investment Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>	
<b>MIDDLESEX COUNTY</b> ► <b>Custodian:</b> State Street Bank & Trust	<ul style="list-style-type: none"> <li>Ares Management, LLC</li> <li>Ascent Venture Partners</li> <li>Auda Private Equity, LLC</li> <li>Boston Millennia Partners</li> </ul>	<ul style="list-style-type: none"> <li>Duke Street Capital</li> <li>Global Forest Partners, LP</li> <li>Globespan Capital Management, Inc.</li> <li>Hunt Investment Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>Intercontinental Real Estate Corporation</li> <li>Invesco Private Capital, Inc.</li> <li>PRIT</li> <li>TH Lee Partners</li> </ul>
<b>MILFORD</b>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>MILTON</b>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>MINUTEMAN REGIONAL</b>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>MONTAGUE</b>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>NATICK</b> ► <b>Custodian:</b> People's United Bank ► <b>Consultant:</b> Fiduciary Investment Advisors, LLC	<ul style="list-style-type: none"> <li>Intercontinental Real Estate Corporation</li> <li>PRIT</li> </ul>	<ul style="list-style-type: none"> <li>SEI Investments Management Corp.</li> </ul>	<ul style="list-style-type: none"> <li>SL Capital Partners, LLP</li> </ul>
<b>NEEDHAM</b>	<ul style="list-style-type: none"> <li>PRIT</li> </ul>		
<b>NEW BEDFORD</b> ► <b>Custodian:</b> State Street Bank & Trust ► <b>Consultant:</b> Segal Marco Advisors	<ul style="list-style-type: none"> <li>Aberdeen Asset Management, Inc.</li> <li>Acadian Asset Management, LLC</li> <li>Blackrock Realty Advisors, Inc.</li> <li>Boston Company Asset Management, LLC</li> <li>Hamilton Lane</li> <li>Hunt Investment Management, LLC</li> <li>Intercontinental Real Estate Corp.</li> </ul>	<ul style="list-style-type: none"> <li>Invesco Private Capital, Inc.</li> <li>Lexington Advisors, Inc.</li> <li>Loomis Sayles &amp; Company</li> <li>Mesirow Private Equity Advisors, Inc.</li> <li>Neuberger Berman Management</li> <li>Pacific Investment Management Company, LLC</li> <li>SEI Trust Company</li> </ul>	<ul style="list-style-type: none"> <li>State Street Global Advisors Limited</li> <li>TA Realty</li> <li>UBS Realty Investors, LLC</li> <li>Wellington Management Company, LLP</li> <li>Westfield Capital Management Company, LP</li> <li>Wilton Asset Management, LLC</li> </ul>



RETIREMENT BOARD	INVESTMENT VENDORS		
<b>NEWBURYPORT</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>NEWTON</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>NORFOLK COUNTY</b> ▶ <b>Custodian:</b> State Street Bank & Trust ▶ <b>Consultant:</b> Wainwright Investment Counsel, LLP	<ul style="list-style-type: none"> <li>• Allianz Global Investors Fund Management, LLC</li> <li>• ArcLight Capital Partners, LLC</li> <li>• Ariel Investments</li> <li>• Ascend Ventures Group, LLC</li> <li>• Boston Millennia Partners</li> <li>• Centersquare Investment Management Holdings, Inc.</li> <li>• Centre Lane Partners, LLC</li> <li>• CHL Medical Partners</li> <li>• Clarion Partners</li> <li>• Collier Investment Management, Ltd.</li> <li>• Constitution Capital Partners, LLC</li> <li>• Corsair Capital LLC</li> <li>• D.E. Shaw Investment Management, LLC</li> <li>• DSF Group</li> <li>• EnTrust Partners, LLC</li> <li>• Gamco Asset Management, Inc.</li> <li>• Gerding Edlen Investment Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Globespan Capital Management, Inc.</li> <li>• Goldentree Asset Management, LP</li> <li>• Halpern, Denny &amp; Company</li> <li>• Hamilton Lane</li> <li>• HarbourVest Partners, LLC</li> <li>• Hunt Investment Management, LLC</li> <li>• Income Research &amp; Management</li> <li>• Intercontinental Real Estate Corporation</li> <li>• Invesco Private Capital, Inc.</li> <li>• Lazard Asset Management, LLC</li> <li>• Lee Munder Capital Group, LLC</li> <li>• LLM Capital Partners</li> <li>• Loomis, Sayles &amp; Company</li> <li>• Mesirow Capital Partners X, LP</li> <li>• Mesirow Financial Institutional Real Estate</li> <li>• MFS International Advisors, Inc.</li> <li>• Monitor Venture Management</li> </ul>	<ul style="list-style-type: none"> <li>• Northern Trust</li> <li>• Preferred Investors</li> <li>• PRIT</li> <li>• PRISM Venture Partners</li> <li>• RhumbLine Advisers</li> <li>• Seizert Capital Partners, LLC</li> <li>• Sentinel Real Estate Corporation</li> <li>• Siguler Guff Advisors, LLC</li> <li>• SL Capital Partners, LLP</li> <li>• State Street Global Advisors</li> <li>• TA Realty</li> <li>• TerraCap Management</li> <li>• Victory Capital Management</li> <li>• Wellesley Advisors Corporation</li> <li>• Wellington Management Company, LLP</li> <li>• Wilshire Associates, Inc.</li> </ul>
<b>NORTH ADAMS</b> ▶ <b>Custodian:</b> People's United Bank	<ul style="list-style-type: none"> <li>• De Burlo Group, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>	
<b>NORTH ATTLEBORO</b> ▶ <b>Custodian:</b> State Street Bank & Trust ▶ <b>Consultant:</b> Dahab Associates, Inc.	<ul style="list-style-type: none"> <li>• AmSouth Bank</li> <li>• Atlanta Capital</li> <li>• Axiom International Investors, LLC</li> <li>• Blackrock Realty Advisors, Inc.</li> <li>• Brandes Investment Partners, LP</li> </ul>	<ul style="list-style-type: none"> <li>• Chicago Equity Partners, LLC</li> <li>• Davenport &amp; Company, LLC</li> <li>• Herndon Capital Management, LLC</li> <li>• Intercontinental Real Estate Corporation</li> <li>• Lazard Asset Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Loomis Sayles &amp; Company</li> <li>• RhumbLine Advisers</li> <li>• Stewart Capital Advisors, LLC</li> <li>• Vontobel Asset Management, Inc.</li> </ul>
<b>NORTHAMPTON</b> ▶ <b>Custodian:</b> People's United Bank	<ul style="list-style-type: none"> <li>• De Burlo Group, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>	
<b>NORTHBRIDGE</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>NORWOOD</b> ▶ <b>Custodian:</b> State Street Bank & Trust ▶ <b>Consultant:</b> Meketa Investment Group, Inc.	<ul style="list-style-type: none"> <li>• Aberdeen Asset Management, Inc.</li> <li>• American Funds</li> <li>• Atlanta Capital</li> <li>• Boston Company Asset Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Columbia Management Investment Advisors, LLC</li> <li>• Constitution Capital Partners</li> <li>• Dimensional Fund Advisors, LP</li> <li>• HarbourVest Partners, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• IFM Investors Advisor</li> <li>• Landmark Partners, LLC</li> <li>• PRIT</li> <li>• RhumbLine Advisers</li> </ul>
<b>PEABODY</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>PITTSFIELD</b> ▶ <b>Consultant:</b> Fiduciary Investment Advisors, LLC	<ul style="list-style-type: none"> <li>• Hunt Investment Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• SL Capital Partners, LLP</li> </ul>
<b>PLYMOUTH</b> ▶ <b>Custodian:</b> People's United Bank ▶ <b>Consultant:</b> Fiduciary Investment Advisors, LLC	<ul style="list-style-type: none"> <li>• Acadian Asset Management</li> <li>• Babson Capital Management</li> <li>• BlackRock Advisors, LLC</li> <li>• Boston Advisors, LLC</li> <li>• Boston Trust Investment Management, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>• Columbia Management Investment Advisors</li> <li>• Intercontinental Real Estate Corporation</li> <li>• Invesco Trust Company</li> <li>• PRIT</li> <li>• Rhumbline Advisers</li> </ul>	<ul style="list-style-type: none"> <li>• Boston Partners Global Investors, Inc.</li> <li>• Templeton Investment Counsel</li> <li>• Wellington Management Company, LLP</li> <li>• Westfield Capital Management Company, LP</li> </ul>

RETIREMENT BOARD	INVESTMENT VENDORS		
<p><b>PRIM</b></p> <p>► <b>Custodian:</b> BNY Mellon</p> <p>► <b>Consultants:</b> Arden Asset Management LLC, Callan Associates, Hamilton Lane, International Woodland Company, NEPC, Townsend</p>	<ul style="list-style-type: none"> <li>• 400 Capital Management</li> <li>• Acadian Asset Management, LLC</li> <li>• Access Capital</li> <li>• Acon Investments</li> <li>• Advent International</li> <li>• AEW Capital Management</li> <li>• AFL-CIO Housing Investment Trust</li> <li>• AgIS Capital, LLC</li> <li>• Alchemy Partners</li> <li>• Alta Communications</li> <li>• American Securities Capital Partners</li> <li>• Anchorage Capital, LLC</li> <li>• Angelo Gordon</li> <li>• APAX Partners &amp; Co.</li> <li>• Apollo Management Co.</li> <li>• AQR Capital</li> <li>• Arden Asset Management</li> <li>• Ascent Venture Partners</li> <li>• Ashmore Investment Management, Ltd.</li> <li>• Asia Pacific Trust</li> <li>• Austin Ventures</li> <li>• Avenue Capital Group</li> <li>• Baillie Gifford</li> <li>• Bain Capital</li> <li>• Battery Ventures</li> <li>• Blackrock Financial Management, Inc.</li> <li>• Blackstone Capital Partners</li> <li>• Blackstone Group</li> <li>• Boston Ventures</li> <li>• Bridgepoint Capital Limited</li> <li>• Brigade Capital G.P., LLC</li> <li>• Brookfield Investment Management</li> <li>• Campbell Group, LLC</li> <li>• Candover</li> <li>• Cantab Capital Partners, LP</li> <li>• Canvas Capital</li> <li>• Canyon Johnson II</li> <li>• Capula Management Limited</li> <li>• Carlyle Group</li> <li>• Carlyle Partners</li> <li>• Castille</li> <li>• Catalyst Investors</li> <li>• Centerbridge</li> <li>• Centerbridge Special Credit Partners</li> <li>• CenterSquare Investment Management</li> <li>• Charlesbank Capital Partners</li> <li>• Charles River Ventures</li> <li>• Charterhouse Group</li> <li>• Chequers</li> <li>• City of London Investment Management Co.</li> <li>• Clifton Group</li> <li>• Code, Hennessey &amp; Simmons</li> <li>• Commonwealth Capital Ventures</li> <li>• Community Capital Management</li> <li>• Contrarian Capital</li> <li>• Crescent Capital Group</li> <li>• CVC Capital</li> <li>• Cypress Merchant Banking Partners</li> <li>• Davidson Kempner Advisors, Inc.</li> <li>• Denham Capital Management</li> <li>• DivcoWest</li> <li>• DLJ Merchant Banking Partners</li> </ul>	<ul style="list-style-type: none"> <li>• Driehaus Capital Management, LLC</li> <li>• East Lodge Capital</li> <li>• Eaton Vance Institutional Funds</li> <li>• El Dorado Ventures</li> <li>• Elliot Capital Advisors, LP</li> <li>• Equitable Capital Management Corporation</li> <li>• Essex Woodlands Health Ventures</li> <li>• Ethos Private Equity</li> <li>• Exponent Private Equity Partners</li> <li>• Fidelity Management Trust Company</li> <li>• FIS Group, Inc.</li> <li>• First Reserve Corporation</li> <li>• Flagship Ventures</li> <li>• Forest Investment Associates</li> <li>• Frontier Capital Management</li> <li>• Freeman Spogli Equity Partners</li> <li>• GENSTAR Capital</li> <li>• Gilde Buy Out Partners AG</li> <li>• Glenview Capital G.P., LLC</li> <li>• Goldman Sachs Investment Management</li> <li>• Gores Capital</li> <li>• GSO Capital Partners</li> <li>• GTCR Golder Rauner</li> <li>• Harding Loevner</li> <li>• Hellman &amp; Friedman Capital Partners</li> <li>• H.I.G. Capital Partners</li> <li>• Highfields Associates, LLC</li> <li>• Highland Capital Partners</li> <li>• Hony Capital</li> <li>• Huber Capital</li> <li>• Index Ventures</li> <li>• Informed Portfolio Management</li> <li>• Insight Venture Partners</li> <li>• Institutional Venture Partners</li> <li>• Intercontinental IV</li> <li>• InterWest Partners</li> <li>• Invesco Realty Advisors</li> <li>• Investec Asset Management</li> <li>• JEN Partners</li> <li>• J.P. Morgan Investment Management</li> <li>• Kainos Capital, LLC</li> <li>• Kelso &amp; Company</li> <li>• Kepha Partners</li> <li>• Keytone Ventures</li> <li>• Kohlberg Kravis Roberts and Co.</li> <li>• KPS Capital Partners</li> <li>• Land and Buildings Investment Management</li> <li>• Landmark Equity Partners</li> <li>• LaSalle Investment Management</li> <li>• Loomis, Sayles &amp; Company</li> <li>• Lovell Minnick Partners</li> <li>• Madison Dearborn Capital Partners</li> <li>• Marathon — London</li> <li>• M/C Venture Partners</li> <li>• Medixi Ventures</li> <li>• Menlo Ventures</li> <li>• Mondrian Investment Partners Ltd.</li> <li>• Montagu</li> <li>• Montreux Equity Partners</li> <li>• Mudrick Capital Management, LP</li> <li>• Nash &amp; Sells</li> <li>• Nautic Partners</li> </ul>	<ul style="list-style-type: none"> <li>• New Boston Urban Fund I</li> <li>• New Enterprise Associates</li> <li>• Nordic Capital</li> <li>• Oaktree Capital Management</li> <li>• Odyssey Investment Partners</li> <li>• Olympus Partners</li> <li>• Onex Capital Partners</li> <li>• OZ Advisors, LP</li> <li>• Pacific Alternative Asset Management Co. (PAAMCO)</li> <li>• Pacific Investment Management Co. (PIMCO)</li> <li>• PAI Europe</li> <li>• PanAgora Asset Management, Inc.</li> <li>• Permira Ventures</li> <li>• Pershing Square G.P., LLC</li> <li>• Pictet Asset Management, Inc.</li> <li>• Polaris Venture Partners</li> <li>• Presima</li> <li>• Providence Equity Partners</li> <li>• Pzena Investment Management</li> <li>• Quantum Energy Partners</li> <li>• Quad-C Management</li> <li>• Rembrandt Venture Partners</li> <li>• Rhone Group, LLC</li> <li>• Riverbridge Partners</li> <li>• Russell Implementation Source</li> <li>• SAIF Partners</li> <li>• SCP Vitalife</li> <li>• SECOR Asset Management</li> <li>• Shenkman Capital Management</li> <li>• Sherbrooke Capital</li> <li>• Sofinnova Ventures, Inc.</li> <li>• Spark Capital</li> <li>• Spectrum Equity Partners</li> <li>• State Street Global Advisors</li> <li>• Steadfast Capital Management LP</li> <li>• Stone Harbor Investment Partners LP</li> <li>• Summit Creek Advisors</li> <li>• Summit Ventures</li> <li>• SV Life Sciences Advisors</li> <li>• TA Associates/Advent</li> <li>• Technology Crossover Ventures</li> <li>• Texas Pacific Group</li> <li>• Thoma Bravo</li> <li>• Thoma Cressey Partners</li> <li>• Thomas H. Lee Equity Partners, LP</li> <li>• Torquest Partners</li> <li>• Towerbrook Capital Partners</li> <li>• Trident Capital</li> <li>• Union Square Ventures</li> <li>• VantagePoint Partners</li> <li>• Vestar Capital Partners</li> <li>• Vista Equity Partners</li> <li>• Voya Financial</li> <li>• Wasatch Advisors Inc.</li> <li>• Welsh, Carson, Anderson &amp; Stowe</li> <li>• Weston Presidio Capital</li> <li>• WestView Capital Partners</li> <li>• Whitney &amp; Company</li> <li>• Willis Stein</li> <li>• Winton Capital Management</li> <li>• Xenon Private Equity, LTD</li> </ul>

RETIREMENT BOARD		INVESTMENT VENDORS	
<b>PLYMOUTH COUNTY</b> ► <b>Custodian:</b> State Street Bank & Trust ► <b>Consultant:</b> Meketa Investment Group	<ul style="list-style-type: none"> <li>• ABS Investment Management, LLC</li> <li>• AEW Capital Management, LP</li> <li>• Akina Limited</li> <li>• Ascend Venture Group</li> <li>• Ascent Venture Partners</li> <li>• Audax Management Company (NY), LLC</li> <li>• Basalt Infrastructure Partners</li> <li>• Berkshire Property Advisors, LLC</li> <li>• Boston Company Asset Management, LLC</li> <li>• BTG Pactual Timberland Investment Group</li> <li>• Carlyle Investment Management</li> <li>• Charles River Ventures</li> <li>• Copper Rock Capital Partners</li> <li>• Denver Investments</li> <li>• DN Partners</li> <li>• DSF Group</li> <li>• Eaton Vance Investment Counsel</li> <li>• EnTrust Partners Offshore, LP</li> </ul>	<ul style="list-style-type: none"> <li>• Fisher Investments</li> <li>• First Eagle Investment Management</li> <li>• Franklin Templeton Investment Management</li> <li>• Geneva Capital Management, Ltd</li> <li>• Global Infrastructure Management, LLC</li> <li>• Globespan Capital Management, Inc.</li> <li>• HGK Asset Management, Inc.</li> <li>• Hunt Investment Management, LLC</li> <li>• IFM Investors Advisor</li> <li>• Income Research &amp; Management</li> <li>• Invesco Trust Company</li> <li>• J.P. Morgan Investment Management, Inc.</li> <li>• KBI Global Investors (North America Ltd.)</li> <li>• Kopernik Global Investors</li> <li>• Landmark Partners, LLC</li> <li>• Lee Munder Capital Group, LLC</li> <li>• Leeds Equity Partners</li> <li>• Lexington Partners, LP</li> </ul>	<ul style="list-style-type: none"> <li>• LLR Management</li> <li>• McDonnell Investment Management, LLC</li> <li>• Mesirov Financial Capital Partners X, LP</li> <li>• Mesirov Financial Institutional Real Estate</li> <li>• Mutti Employer Property Trust</li> <li>• New Boston Fund, Inc.</li> <li>• NewTower Trust Company</li> <li>• Prudential Real Estate Investors</li> <li>• RhumbLine Advisers</li> <li>• Rohatyn Group</li> <li>• SEI Trust Company</li> <li>• Siguler Guff Advisers, LLC</li> <li>• Summit Partners, LP</li> <li>• THL Credit Advisors, LLC</li> <li>• TimberVest, LLC</li> <li>• Wellesley Advisors Corporation</li> <li>• Wellington Management</li> <li>• Wellspring Capital Management, LLC</li> </ul>
	<b>QUINCY</b> ► <b>Custodian:</b> State Street Bank & Trust ► <b>Consultant:</b> Meketa Investment Group, Inc.	<ul style="list-style-type: none"> <li>• Aberdeen Asset Management, Inc.</li> <li>• Acadian Asset Management, LLC</li> <li>• Adams Street Partners, LLC</li> <li>• AEW Capital Management, LP</li> <li>• Beach Point Capital Management, LP</li> <li>• Brookfield Asset Management</li> <li>• Brown Advisory, LLC</li> <li>• Colony Realty Partners</li> <li>• Columbia Management Investment Advisors, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Copper Rock Capital Partners, LLC</li> <li>• Goldman Sachs Asset Management, LP</li> <li>• Hancock Timber Resource Group, Inc.</li> <li>• IFM Investors Advisor</li> <li>• LLR Management</li> <li>• Loomis Sayles &amp; Company</li> <li>• Oppenheimer Alternative Investment Management</li> <li>• PRIT</li> </ul>
<b>READING</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>REVERE</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>SALEM</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>SAUGUS</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>SHREWSBURY</b> ► <b>Consultant:</b> Dahab Associates, Inc.	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>SOMERVILLE</b> ► <b>Custodian:</b> Comerica Securities	<ul style="list-style-type: none"> <li>• Congress Asset Management Company, LLP</li> <li>• Lazard Asset Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Loomis Sayles &amp; Company</li> <li>• RhumbLine Advisers</li> </ul>	<ul style="list-style-type: none"> <li>• UBS Realty Investors, LLC</li> </ul>
<b>SOUTHBRIDGE</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>SPRINGFIELD</b> ► <b>Custodian:</b> PeoplesBank	<ul style="list-style-type: none"> <li>• Boston Millennia Partners</li> </ul>	<ul style="list-style-type: none"> <li>• Crescendo Ventures Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>
<b>STATE</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>STATE TEACHERS</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>STONEHAM</b> ► <b>Custodian:</b> SEI Private Trust Company ► <b>Consultant:</b> Fiduciary Investment Advisors, LLC	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• SEI Investments Management Corp.</li> </ul>	

RETIREMENT BOARD	INVESTMENT VENDORS		
<b>SWAMPSCOTT</b> ▶ <b>Custodian:</b> People's United Bank ▶ <b>Consultant:</b> Dahab Associates	<ul style="list-style-type: none"> <li>• Intercontinental Real Estate Corporation</li> </ul>	<ul style="list-style-type: none"> <li>• North Sky Capital, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>
<b>TAUNTON</b> ▶ <b>Custodian:</b> State Street Bank & Trust ▶ <b>Consultant:</b> Dahab Associates, Inc.	<ul style="list-style-type: none"> <li>• Aberdeen Asset Management</li> <li>• BlackRock Investment Management, LLC</li> <li>• Boston Millennia Partners</li> <li>• Brandywine Global Investment Management, LLC</li> <li>• Ceres Partners, LLC</li> <li>• C.S. McKee, LP</li> <li>• Denver Investments</li> <li>• Earnest Partners, LLC</li> <li>• Frontier Capital Management Co., LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Glovista Investments, LLC</li> <li>• Intercontinental Real Estate Corporation</li> <li>• Invesco Core Real Estate USA, LP</li> <li>• Invesco Trust Company</li> <li>• Invesco Private Capital, Inc.</li> <li>• Long Wharf Real Estate Partners, LLC</li> <li>• Manulife Asset Management, LLC</li> <li>• Molpus Woodlands Group, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Polen Capital Management, LLC</li> <li>• Quantitative Management Association</li> <li>• State Street Global Advisors</li> <li>• TimberVest, LLC</li> <li>• Vontobel Asset Management, Inc.</li> <li>• Weaver C. Barksdale &amp; Associates</li> <li>• Wells Capital Management, Inc.</li> </ul>
<b>WAKEFIELD</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>WALTHAM</b> ▶ <b>Custodian:</b> SEI Private Trust Company ▶ <b>Consultant:</b> Fiduciary Investment Advisors, LLC	<ul style="list-style-type: none"> <li>• Ascent Venture Partners</li> <li>• Hunt Investment Management, LLC</li> <li>• Intercontinental Real Estate Corporation</li> </ul>	<ul style="list-style-type: none"> <li>• Invesco Private Capital, Inc.</li> <li>• Precision Capital Advisors, LLC</li> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• RCP Advisors, LLC</li> <li>• SEI Investments Management Corporation</li> </ul>
<b>WATERTOWN</b> ▶ <b>Custodian:</b> State Street Bank & Trust ▶ <b>Consultant:</b> Fiduciary Investment Advisors, LLC	<ul style="list-style-type: none"> <li>• Acadian Asset Management, LLC</li> <li>• Arsenal Real Estate Funds, LLC</li> <li>• Auda Private Equity, LLC</li> <li>• Blackrock Advisors, LLC</li> <li>• Brandywine Global Investment Management, LLC</li> <li>• Columbia Management Investment Advisors, LLC</li> <li>• Earnest Partners, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Eaton Vance Management</li> <li>• Guggenheim Partners Investment Management, LLC</li> <li>• Income Research &amp; Management</li> <li>• Intercontinental Real Estate Corporation</li> <li>• Lee Munder Capital Group, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Massachusetts Financial Services Company</li> <li>• New Boston Fund, Inc.</li> <li>• PRIT</li> <li>• RCP Advisors, LLC</li> <li>• SEI Trust Company</li> <li>• Wellington Management Company, LLP</li> </ul>
<b>WEBSTER</b> ▶ <b>Custodian:</b> State Street Bank & Trust ▶ <b>Consultant:</b> Wainwright Investment Counsel, LLC	<ul style="list-style-type: none"> <li>• HGK Asset Management Inc.</li> <li>• Lee Munder Capital Group, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Loomis Sayles &amp; Company</li> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• RhumbLine Advisers</li> <li>• SEI Trust Company</li> </ul>
<b>WELLESLEY</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>WEST SPRINGFIELD</b> ▶ <b>Custodian:</b> Comerica	<ul style="list-style-type: none"> <li>• AmSouth Bank</li> </ul>	<ul style="list-style-type: none"> <li>• De Burlo Group, Inc.</li> </ul>	
<b>WESTFIELD</b>	<ul style="list-style-type: none"> <li>• Addenda Capital</li> <li>• Boston Company Asset Management, LLC</li> <li>• Columbia Management Investment Advisers, LLC</li> <li>• Constitution Capital Partners, LLC</li> <li>• Fisher Investments</li> <li>• Hamilton Lane</li> <li>• Income Research &amp; Management</li> </ul>	<ul style="list-style-type: none"> <li>• Intercontinental Real Estate Corporation</li> <li>• Lazard Asset Management, LLC</li> <li>• LMCG Investments</li> <li>• Long Wharf Real Estate Partners, LLC</li> <li>• Loomis Sayles &amp; Company</li> <li>• Polaris Capital Management, LLC</li> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• RBC Global Asset Management (U.S.), Inc.</li> <li>• SEI Trust Company</li> <li>• State Street Global Advisors</li> <li>• TerraCap Management</li> <li>• Wasatch Advisors, Inc.</li> <li>• Wells Capital Management, Inc.</li> </ul>

RETIREMENT BOARD	INVESTMENT VENDORS		
<b>WEYMOUTH</b> ► <b>Custodian:</b> Comerica ► <b>Consultant:</b> Fiduciary Investment Advisors, LLC	<ul style="list-style-type: none"> <li>• Aberdeen Asset Management, Inc.</li> <li>• Acadian Asset Management, LLC</li> <li>• Adams Street Partners</li> <li>• Ashmore Investment Advisors</li> <li>• BlackRock Advisors, LLC</li> <li>• Boston Company Asset Management, LLC</li> <li>• Brandywine Global Investment Management, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• Constitution Capital Partners, LLC</li> <li>• HarbourVest Partners, LLC</li> <li>• Intercontinental Real Estate Corporation</li> <li>• Invesco Private Capital, Inc.</li> <li>• Landmark Partners, LLC</li> <li>• Loomis Sayles &amp; Company</li> <li>• OFI Global Institutional, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>• Pioneer Institutional Asset Management Inc.</li> <li>• PRIT</li> <li>• RhumbLine Advisers</li> <li>• RS Investment Management Company, LLC</li> <li>• Singular Guff Advisers, LLC</li> <li>• State Street Global Advisors</li> <li>• Wasatch Advisors</li> </ul>
<b>WINCHESTER</b> ► <b>Custodian:</b> State Street Bank & Trust	<ul style="list-style-type: none"> <li>• Guggenheim Real Estate, LLC</li> <li>• PRIT</li> </ul>	<ul style="list-style-type: none"> <li>• State Street Global Advisors</li> </ul>	<ul style="list-style-type: none"> <li>• Wellington Management Company, LLP</li> </ul>
<b>WINTHROP</b>	<ul style="list-style-type: none"> <li>• PRIT</li> </ul>		
<b>WOBURN</b> ► <b>Custodian:</b> State Street Bank & Trust ► <b>Consultant:</b> Wainwright Investment Counsel, LLC	<ul style="list-style-type: none"> <li>• Alliance Bernstein, LP</li> <li>• Charlesbank Capital Partners, LLC</li> <li>• Earnest Partners, LLC</li> <li>• Hunt Investment Management, LLC</li> <li>• Intercontinental Real Estate Corporation</li> </ul>	<ul style="list-style-type: none"> <li>• Invesco Private Capital, Inc.</li> <li>• Loomis Sayles &amp; Company</li> <li>• PRIT</li> <li>• RhumbLine Advisers</li> </ul>	<ul style="list-style-type: none"> <li>• Stafford Private Equity Inc.</li> <li>• State Street Global Advisors</li> <li>• Wilshire Associates, Inc.</li> <li>• Victory Capital Management</li> </ul>
<b>WORCESTER</b> ► <b>Custodian:</b> State Street Bank & Trust ► <b>Consultant:</b> Meketa Investment Group; Fiduciary Investment Advisors	<ul style="list-style-type: none"> <li>• Acadian Asset Management, LLC</li> <li>• AEW Capital Management, LP</li> <li>• American Securities, LLC</li> <li>• Ascent Venture Partners</li> <li>• Boston Millenia Partners</li> <li>• BTG Pactual Timberland Investment Group, LLC</li> <li>• Capital International, Inc.</li> <li>• Charlesbank Capital Partners, LLC</li> <li>• Global Infrastructure Management, LLC</li> <li>• Hancock Natural Resource Group, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>• Harvest Partners, LP</li> <li>• IFM Investors (US) Advisor, LLC</li> <li>• Income Research + Management</li> <li>• Invesco Private Capital, Inc.</li> <li>• Lazard Asset Management, LLC</li> <li>• Lee Munder Capital Group, LLC</li> <li>• Loomis Sayles &amp; Company</li> <li>• Newstone Capital Partners, LLC</li> <li>• Northstar Company, LLC</li> </ul>	<ul style="list-style-type: none"> <li>• PRIT</li> <li>• Ridgmont Equity Partners</li> <li>• Riverside Company</li> <li>• SL Capital Partners, LLP</li> <li>• State Street Global Advisors</li> <li>• TA Associates Management</li> <li>• Vitruvian Partners, LLP</li> <li>• White Deer Energy</li> <li>• William Blair &amp; Company, LLC</li> </ul>
<b>WORCESTER REGIONAL</b>	<ul style="list-style-type: none"> <li>• AEW Capital Management, LP</li> <li>• Ascent Venture Partners</li> </ul>	<ul style="list-style-type: none"> <li>• Hunt Investment Management, LLC</li> <li>• Intercontinental Real Estate Corporation</li> </ul>	<ul style="list-style-type: none"> <li>• PRIT</li> <li>• TA Realty</li> </ul>

# PERAC DIRECTORY | UNITS AND STAFF MEMBERS

## ADMINISTRATION

**Joseph E. Connarton**  
Executive Director

**Michael J. DeVito**  
Director of Strategic Planning,  
Management & Public Affairs

**Kim Boisvert**  
Senior Executive Assistant

**Katie Bozzi**  
Accounts Payable Specialist

**Ellen Furtado**  
Administrative Assistant

**Joseph I. Martin**  
Deputy Executive Director

**Caroline J. Garcia**  
Director of Administrative  
Services

**Virginia Barrows**  
Chief Financial Officer

**Tracey Legaski**  
Administrative Assistant

**Patricia Tanso**  
Administrative Assistant

**John W. Parsons**  
Deputy Director/  
General Counsel

## ACTUARIAL

**James Lamenzo**  
Actuary  
**John Boorack**  
Actuary

**Timothy Larkin**  
Senior Actuarial Analyst

**Sherry Brooks-Ross**  
Benefit Calculation Specialist

**Samantha MacMillan**  
Actuarial Analyst

**Michael Humbert**  
Actuarial Analyst

## AUDIT

**Caryn M. Shea, CPA, CFS**  
Chief Auditor

**George Nsia**  
Auditor

**Elaine Pursley, CPA**  
Auditor

**Michael Nicolazzo**  
Auditor

**Junior Yang**  
Auditor

**Scott Henderson**  
Deputy Chief Auditor

**Carol Poladian, CPA**  
Auditor

**Richard Wrona, CPA**  
Auditor

**Walter Kloc**  
Auditor

## COMMUNICATIONS

**Natacha Dunker**  
Communications Director

**Karen McMahon**  
Graphic Designer/Editor

**Michael D. Litvack**  
Webmaster/Graphic Design  
Specialist

**Ben Polatin**  
Communication Specialist

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Manager of Medical Services

**Patrice Looby**  
Nurse Case Manager

**Jane Carritte**  
Clinical Case Manager

**Regina Manning**  
Case Manager I

**Erin Groesser**  
Administrative Assistant

## FRAUD PREVENTION

**Sandra King**  
Fraud Prevention Manager

## INFORMATION SYSTEMS

**Dan Boyle**  
Director of Information  
Systems

**K-Lone Steele**  
Senior Systems Engineer

**Irina M. Boukina**  
Senior Programmer/Analyst

**Charles Hoyt**  
Senior Programmer/Analyst

**Robert Perez**  
Senior Systems Engineer

**Anthony Tse**  
Project Manager

**John C. Philley**  
.NET Developer

## INVESTMENT/COMPLIANCE

**Thomas J. O'Donnell**  
Compliance Officer

**Cheryl Johnson, CFA**  
Compliance Analyst

**Victoria Marcorelle**  
Senior Investment Analyst

**Veronica Colon**  
Investment Analyst

**Rose Morrison**  
Administrative Assistant

**Derek Moitoso**  
Compliance Counsel

## LEGAL

**Judith Corrigan**  
Deputy General Counsel/  
Managing Attorney

**Kenneth Hill**  
Senior Associate General  
Counsel

**Patrick Charles**  
Associate General Counsel

**Doreen Duane**  
Executive Assistant



